THE BUILDER

A RECORD OF ARCHITECTURE AND CONSTRUCTION.

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CONTROL AND HOUSING.

WE have been told that control of building will be necessary for some time after the war in order that a sufficiency of materials and labour may be available for municipal housing schemes. With regard to labour there is no justification for assuming that sufficient men will not be available for both public and private work; with respect to materials there are, it would seem, other methods of obtaining the required results. Assuming that the figures as to the number of houses required are correct, is there any reason why the Government, acting through the municipalities, should not place orders in bulk with manufacturers and merchants, stipulating for delivery by certain dates in defined districts? If it were discovered that the necessary contracts cannot be made because of the inadequacy of plant in the case of commodities like bricks and glass, it would be open to the authorities either to grant loans to manufacturers to cover the cost of enlarging works and setting up additional plant (such loans to be repayable within a stated time), or else to develop fresh brickfields and works, selling them at the end of the period of stress in the open market. But we think every manufacturer should be free to devote himself wholly or in part to fulfilling such municipal contracts, or to reserve himself wholly or in part to fulfilling private contracts. As to wood, which, no doubt, is the greatest difficulty, the authorities who are to control shipping for some time after the war in order to meet the shortage of tonnage will be in an exceptionally favourable position to place contracts for the material which may be required. In addition, we believe the amount of timber needed might be enormously lessened (1) by the substitution of fibre and composition panels for wood in doors, and lighter stiles and rails would suffice for such panels; (2) by the extended use of tiles for skirtings, window boards and in other positions; (3) by the use of fibrous plaster in ceilings, eliminating the use of laths, and by the substituting of torching and other methods for roof boarding. It also might be feasible to use some composition covering directly on concrete for the ground floors of cottages, much as the more expensive cork carpetry is often used for the floors of libraries. It would be possible by adopting the means we have outlined to do away with the necessity for any official restrictions of building inevitably detrimental to the commercial interests of the community—restrictions which have a far-reaching effect, since on our trade depend the wages and conditions of employment of the workers as well as the prosperity of the nation.

The course we suggest would necessitate a common agreement between the makers of a given commodity such as glass, bricks, or concrete, and provisions for the methods by which prices should be fixed, but we believe a satisfactory agreement would be easily come to, while in case of difference of opinion neither side could object to reference to competent arbitrators. The difficulty as to prices must, in any case, be met even if the Government or municipalities became, under a system of control, the only purchasers; so we do not see that this should stand in the way of a plan which would secure to private enterprise the liberty which it has previously had in all eras of our history, greatly, we believe, to the advantage of the State itself. Our Government would certainly reject with indignation the suggestion that they wished to "bear" the market by taking away from private individuals their liberty of action which is the only advantage which could accrue from a system of Control.

Another necessity is the repeal of the Increment Duty and the Duty on undeveloped land, for what is needed is building; and the possibility of making a profit on land, and its security as an investment, have been the inducement which has led builders to erect houses at cost price, or nearly so; and the security formerly offered by such property has been the means of securing loans and mortgages. We shall put before our readers shortly proposals made by an eminent authority, in which, by a readjustment of our rating system, the heavy weekly charge for rates in respect to housing property can be reduced without loss to the community and another incentive given to both public and private enterprise in building. The net effect of the changes advocated would be that, though the cost of building has been very largely increased, there would be a reduction in respect to rates, the result of which would be to leave the weekly charge much as it was before the war, thus solving the problem of the economic rent.

Looking at matters from a broad and unprejudiced standpoint, all must recognise that it never would have been possible to crowd workmen's houses on insufficient ground had it not been for the fact that public opinion in the past was satisfied with such conditions. The high price of land required for building development was made possible because the law and public opinion permitted crowding. But now that we have the Housing and Town Planning Act, which can be adopted by any locality, it is impossible to crowd houses unduly, while the measure automatically does away with the possibility of holding up land for an excessive price, since it governs the financial returns which can be obtained from a given area; and, in addition, machinery is introduced to further safeguard the interests of the purchaser. This is an additional reason for amending the Finance Act, since the damage it has done is to destroy the sense of security which is the necessary condition for adequate and speedy development; while the evils which the Finance Act was primarily intended to cure are adequately met and dealt with under the clauses of the Housing and Town Planning Act. If we protect the interests of the large landowners, we at the same time protect the interests of the multitude of smaller men, down to the workman, who sees in the possession of land and buildings the best form of saving and investment. If we want a nation of small freeholders, we must do all we can to make land and building a gilt-edged security; and if we do so, we shall probably find that a increasing number of the nation will rise in social status and in comfort.

Mankind has drifted into a terrible war, which is the greatest calamity in the history of mankind, because the nations of central Europe envied their neighbours and thought they could obtain their ends by force. No possible re-arrangement of boundaries, no possible conditions of peace, could make good the wealth and life destroyed in the present titanic struggle; and surely the greatest lesson we can all learn from recent events is that we should seek the goal of our common humanity without violence or disregard to the interests of any section of the body politic. We must not favour any class or body in the nation to the disadvantage of any other, but should work together, rendering unto Cæsar that which is Cæsar's, because if we do less than justice to all our work will not endure. We should by wise administration get rid of wasteful methods and obsolete machinery, but we should not in obstinacy and prejudice set up new grievances and injustices to burden a future generation, who will be called on to pay for our mistakes with interest; and there is no question which may lead to greater evils than the solution of the housing problem on lines which inflict injustice on any section of the community, simply because its voting strength may be outnumbered for a time.

NOTES.

Metropolitan Water Board v. Dick, Kerr.

IT is gratifying that the House of Lords have affirmed the Court of Appeal in the case of Metropolitan Water Board *v.* Dick, Kerr & Company, and that the action of the Ministry of Munitions in interfering with the execution of the works has been held to be such a cause as would justify the contract being treated as terminated. From the very first we have maintained that the decision of Mr. Justice Bray could not be supported, and in an article entitled "The Devil and the Deep Sea" (July 18th, 1916) we pointed out the inequitable results of such a decision. It must be remembered, however, that the Court of Appeal is less bound by decided cases than a court of first instance; and therefore in that Court, and more especially in the House of Lords, cases can be considered from a wider point of view. The case is only shortly reported, and we shall refer to it again; but one of the contentions in the House of Lords appears to have been that the case was to be distinguished from a contract such as for the sale of goods, because it was for the construction of works of a very permanent character. The House pointed out that, however permanent the character of the works might be, the contract specified a limited period for their construction, viz., six years; and that it was obvious such an interference as had taken place, and which must of necessity be very uncertain in its duration, must entirely alter the conditions under which the contract was made.

Technical Conference of the Housing and Town Planning Council.

WE hope shortly to give the greater part of the Interim Report of the Housing and Town Planning Council, which contains much useful and interesting matter, though it is not entirely free from a fault which militates against the usefulness of a good many of the voluntary and official bodies who are now considering the future of industries at the end of the war—we refer to the assumption of the necessity for State direction and control on an extended scale. We believe that quite as much will be effected by the removal of restrictions as by the inverse process of increasing the number of regulations. The Repeal of the Finance Act comes first, the amendment of the Laws of Rating second, the adoption of a modified and more liberal code of local by-laws third. The security of land and buildings as an investment must be re-established. And if these wants are met we have faith that in the future, as in the past, necessary housing will be carried out without the heroic measures which many, hypnotised by the unusual experiences of the war, would like to graft on to our laws and customs.

Insurance and Damage from Enemy Air Raids.

WE have in these columns had frequent occasion to point out that the subject of insurance against fire has been vastly complicated, in the first place, by a new form of risk—damage from enemy aircraft bombs; and, secondly, by the introduction of the Government's scheme of insurance. The latest case on the first of these two questions is Upjohn *v.* Hitchens. There was a second case, Upjohn *v.* Ford, but the two cases were tried together, the facts being similar in each case. The plaintiff was the lessor of a parcel of land on a lease for 99 years at a ground rent of £8, and by the lease the defendant had covenanted to insure and keep insured all erections and buildings on the demised parcel of ground against loss and damage by fire in a named insurance office or some other responsible office in London or Westminster, to be previously approved in writing by the plaintiff, in the sum of £500 at least, and to produce on demand the policies or receipts for premiums. There was no question that the defendants had not insured in an approved office, or that they had failed to produce the documents when required to do so, but the policy of the insurance company contained this exception, "This policy does not cover loss or damage occasioned by or happening through invasion, foreign enemy . . . military, and usurped power," and in the case Rogers *v.* Whittaker, to which we drew attention in our issue of April 27, it was held that a fire policy containing these exceptions does not cover damage by fire occasioned by an incendiary bomb dropped by enemy air-craft. The plaintiff, who was agent for the insurance company, was aware of the fact that the policies would not cover this class of damage, and correspondence had passed between him and the defendants in which he had pointed this out, and he had called upon them to insure against it; but as they had not complied, he had served notices upon them under Section 14 of the Conveyancing Act, 1881, specifying the breach of covenant complained of, *i. e.*, the failure to insure against this risk, and calling upon them to remedy the breach. The defendants did not comply with these notices, and the plaintiff then commenced this action to recover possession of the premises, the lease containing a proviso for re-entry in the event of breach of covenant. The plaintiff contended that the covenant to insure against fire was absolute and unconditional, but the Court held that the covenant was satisfied by taking out a policy with a company approved by the plaintiff in the usual form, *i.e.*, in the form usual at the date of the lease.

The Case of Enlayde *v.* Roberts.

THIS decision by itself is clear and easy to follow, but the case has to be distinguished from Enlayde *v.* Roberts which we set out in our columns, December 1, 1916. Shorn of many complicated features which occurred in that case, it may be stated that in a lease it was provided that the lessee should keep and deliver up the premises in repair, "damage by fire excepted," whilst the lessor was to insure and keep insured the demised premises "against loss or damage by fire" in some office of repute to be selected by the lessor. The lessee was to repay the lessor the sums paid by him in thus insuring the premises. The lessor was to spend the proceeds of the insurance in reinstating the premises. The premises were destroyed by an incendiary bomb dropped by enemy aircraft, and the plaintiff, the lessee, said that the defendants had failed to insure against loss or damage from fire. The defendant had insured with an office of repute, but the policy contained the exception "loss or damage by or happening through invasion, foreign enemy . . . or military or usurped power" and therefore did not cover this loss. Evidence was given that it was usual in all policies to insert these exceptions, and it was contended that the obligation to insure with some office of repute, involved only the obligation to insure subject to the usual exceptions, and that these words must be imported into the expression "loss or damage by fire" wherever it was used in the lease. The court held that the evidence as to the terms of policies granted by offices of repute was not admissible, but that, even if it were, there was sufficient divergence in the terms of the policies to prevent a settled practice being established; and, further, the court held the covenant to be absolute in its terms to insure against any loss or damage by fire, however caused, and that the defendant was liable.

Mr. Voysey's Letter.

WE cannot at all agree with Mr. Voysey's contention that 7 ft. 0 in. is a desirable height for any habitable room, nor can we agree with Mr. Baillie Scott's assertion that the ventilation of any room can be effected satisfactorily if its window space is well arranged. To make our point clear we may assume that two adjacent sides of a room are composed of opening windows, and that such a room is 30 ft. 0 in. square, and (for the sake of argument) 4 ft. 0 in. in height. We doubt whether anyone would assert that the corner furthest from the opening sides would be fresh under such circumstances, because the floor and ceiling would be too close together to admit of the free circulation of air. If, in such circumstances, the two opposite sides were wholly composed of opening lights, and on one of these sides the wind was blowing, there would be an intolerable draught in the room. We have, on the other hand, abundant proof in comparatively high rooms, that a relatively small opening, high up, does ventilate a room or hall. We have suggested an extreme and impossible case in order to make our point clear, but the same reasons apply, in a greater or less degree, to old cottages or to buildings based on similar lines. As we have said, we are inclined to consider 8 ft. 6 in. a reasonable minimum height, which should rarely be reduced, though it may be that in building cottages, so much that should be given has to be sacrificed that builders should have a greater margin of liberty than at present.

The Royal Society of Painters in Water Colours.

ALL who love Art should visit the Winter Exhibition of the Royal Society of Painters in Water Colours, as the pictures on view are of unusual excellence. Mr. Anning Bell is at his best in two small pictures, No. 133, "Head of a Girl," and No. 139, "Pomona," which show a consummate knowledge of the decorative effects of colour, and are at the same time vivid and life-like pictures. Mr. W. Russell Flint's decorative studies, No. 46, "Bain Grec," and No. 210, "Une Toilette Blanche," are both very pleasing in their fresh clean colouring and clear delineation. Mr. Cayley Robinson gives a series of scriptural subjects—No. 48, "Rachel"; No. 185, "Adam"; and No. 191, "Eve"—which are vivid in their intensity, and examples of perfect decorative studies instinct with vigour and life. In "Gnomes," No. 108, Mr. Arthur Rackham has given us one of his finest examples of quaint fancy. Besides these more decorative studies, there is an unusually strong collection of landscapes: by Mr. Leslie Thomson, No. 23, "In the Highlands"; No. 38, "The Greek Theatre, Syracuse," by Mr. W. Matthew Hale; No. 49, "In the Lambourn Valley," by Mr. D. Murray Smith; No. 71, "The Downs near Swanage," by Mr. W. Eyre Walker; No. 82, "Verona," by Mr. Albert Goodwin, showing a descending road lined by cypresses, with the city beyond outlined against an evening sky; and a very clever example of Mr. F. Cadogan Cooper's work, "The Young Duchess," No. 100, which is delicate and pleasing in colour. Of another category is the admirably imaginative presentation of the "Flying Dutchman," by Mr. J. C. Dollman, No. 31, and two cartoons by Mr. E. J. Sullivan, the "Shan van Vocht," No. 204, which was published in the *Daily Chronicle*, and the "Shan van Vocht and the Gossoon," No. 202, a cartoon not published, probably because its bitter irony was held to be too true to render its publication opportune.

THE FUNCTIONS OF AN ARCHITECTURAL SOCIETY.

MR. H. T. HARE (President) took the chair on November 22 at No. 9, Conduit-street, W., at the first of the series of informal conferences arranged by the Royal Institute of British Architects for the winter session, when Mr. Sidney Webb opened a discussion on the subject of "The Functions of an Architectural Society."

Mr. Webb said he did not claim to know anything about architecture or the history of architecture, or architects. His interest in the subject of the suggestions he would make came from another standpoint altogether. He had written a sketch of the Institute as a professional association, but it had nothing to do with the subject of architecture. His business was public administration, and the Institute came before him as a professional association. He had tried to see how professional associations had developed in the last century, what work had been done and what had been their success. Twenty-five years ago his wife and himself spent six years of their lives studying trades unions, and they then suggested that someone should study the brain-workers' associations. No one had done so, but a year or two ago his wife and himself took the job on for another purpose. Their reason for doing so was that in the past fifteen or twenty years there had been a great revival and extension of what he would call vocationalism in the world, and especially in this country, France and America. By that he meant that the vocation or occupation or trade to which a man belonged was a much more important thing than the parish or city or county, or even the country to which he belonged, and therefore he ought to associate very much more with people of his own craft or vocation, than merely with his geographical neighbours, and that, moreover, the part he had to play in government and democracy ought to a very large extent to be played through his professional organisation and not merely through his geographical organisation.

The Royal Institute of British Architects began in 1834, as what they would call technically a subject association. Its business then was not to look after architects, but to promote architecture, and it included not only architects, but other people interested in architecture. Like other professional associations, the Institute had devoted a great deal of attention to professional education, and also like other associations to the question of professional registration. It was astonishing how much alike professional associations were. All brain-workers' professions had a great deal in common. Like other professional associations the Institute gradually developed its code of ethics. There were three impulses which had led to the various brain-workers associating themselves. The first was the creative impulse—the desire to promote the art or the science, to develop and extend and advance it in all directions. Along with that came the fellowship impulse—the desire of every man to associate with his kind. Out of that had grown good fellowship and social meetings, and benevolent funds and so on. The third impulse was what he might call the possessive impulse, which was the desire of each profession to get as much out of the community as it could for the collective services of its members. This possessive impulse made them stand up against the ignorant oppression of the mass of the community; but it had an invidious side, and in one profession after another it had led to various attempts which were not perhaps in the public interest.

As to the results of professional associations, he thought the Institute, as was the case with other brain-workers' associations, had led to a considerable elevation of the profession. In most of such associations they did not find the "swells" of the profession coming in at first. It was the rank and file which felt the need for an association for raising the profession in the public estimation, and later on the leaders of the profession came in. There could be no doubt that the architectural profession stood very much higher than it did fifty or a hundred years ago in the estimation of the nation, and he believed a great deal of that was due to the long continued efforts of the Institute. He did not wish to say anything about the improvement in architecture, on which he did not claim to be qualified to judge; but one could not help noticing that the efforts of the Institute for architectural education had at any rate left their mark on the rank and file, and that the rank and file architect was a considerably better educated person than was the rank and file architect of 100 years ago. He did not wish to criticise the bad effects of the possessive impulse in their case, but he would like to say one thing. He had never yet seen his way out of the dilemma of the architect in respect of his charge by percentage on the gross cost of a building. He had no reason to complain of architects or to criticise them in that respect, but it was illogical and a very awkward dilemma to be put in. As an architect said to him one day, "I have had a very hard day's work. I have been all day up and down the building, and as the result I have knocked at least £20 off my remuneration." He made no suggestion as a solution for that difficulty. The ordinary type of brain-working professional was a man who worked for a fee for a succession of clients, by himself and for himself. In modern times, there was a good deal to be done by scientific management—by team work. To give an illustration, they all knew there was a great need for dentists; but he felt that if the needs of the whole nation were to be served, it would be necessary to have different grades to attend to certain parts of the work. If each dentist was to be fully qualified to be able to attend to the whole thing, as now, obviously the needs of the whole nation would not be served.

The general fault of professional associations was their tendency to exclusiveness, and there was one form of exclusiveness from which it was very difficult to get away. Had it occurred to them that they were drawing practically all their statesmen, lawyers, doctors, ministers of religion, editors and architects from about ten per cent. of the population, viz., from those whose parents were able to give them some sort of secondary education in adolescence. In doing that they were necessarily excluding the potential geniuses who had not those advantages. This possession of education was not a requirement he protested against, as it was necessary, and a way of meeting the difficulty was to extend the means of secondary education to the whole population. He thought, however, there was a tendency in some professions to make the length of training too long, and he suggested that professional associations in arranging the curriculum and in fixing the fees should be watchful of this tendency to exclusiveness. The most serious exclusiveness arose from the fact that the professions were generally governed by men fifty-eight years of age. He fixed fifty-eight because that was his own age. The technique of these men was the technique of thirty years ago, and their knowledge of education related to the education of thirty years ago. He suggested there was a tendency in professional associations to ignore (quite honestly) the new technique and methods with which the average elderly member was not acquainted. He did not know what buildings would be constructed of in the next generation; it might be aluminium or basic slag, but he very much expected that any new material would have to overcome a certain amount of prejudice before it became actually accepted by the rank and file of their profession.

He need say little about the creative impulse and the fellowship impulse. The creative impulse must really be the fundamental purpose of a professional association. With regard to the possessive impulse it was legitimate to insist on the profession having its proper place in the world. A professional association was entitled to claim participation in the government of the profession, for every profession needed to be regulated in all sorts of ways—the conditions of entry and of training, the professional code, and so on. He did not think, however, that from the standpoint of political science a profession could be left to govern itself. If it were allowed to determine the conditions of entry to the profession it would make the association a monopoly. The association could help the State to fix the conditions of entry, but the State could not allow it to fix the conditions itself. Similarly professional associations could take a large share in prescribing the conditions of training, but it could not have complete control. It might prescribe a training which would run counter to the interests of another profession or to the interests of the community at large. A very large part of the function of a professional association seemed to him to be one which it had not, to any great extent, yet exercised, and that was it ought to claim the right and duty to criticise everything that was done by the Government or by any public authority in the lines of its own profession. It ought not merely to make that criticism in an irresponsible way, but should regard it as a duty to inform the Government of professional opinion on every act done or left undone on which the profession had a distinct opinion. One of the worst elements of the present Government was the secretiveness of official bureaucracy and the suppression, as far as possible, of any professional criticism of its work. No architect in Government service was allowed to criticise the decisions or acts of a Government Department from the point of view of architecture. Curiously enough, that did not apply to the local government service, for the meetings of the Institution of Municipal and County Engineers were largely taken up with professional criticism of drainage and lighting and other schemes of municipal bodies. Perhaps the rule which applied to Government servants was necessary, but if so, it was all the more necessary that the criticism should be supplied by the professional association. He would go further and say that every Government Department should have a professional advisory council. He would give that advisory council no power, but it should express its views freely and publicly upon all the projects of the Government in reports which should be laid before Parliament. He thought every ministry ought to have an advisory professional council of the particular profession with which its work was concerned. His third point was that it was the duty of the professional association to bring to the public notice and agitate for a sufficient supply of its service to the community as a whole. Practically all professions began as the paid servants of the rich and had developed out of that to become the servants of the community, but, unfortunately, a great mass of the community had still to go without the services which the professions could render. If they asked him to apply that to architecture, he admitted he was a little in a difficulty. But he could not help noticing that in the early days of their association architecture was thought of only as a luxury of the rich, and even down to the end of the nineteenth century it was possible to say that all building did not require an architect. Architects should claim to be responsible for all building, and in that he included town planning. When they considered the awful buildings and town planning to which the greater part of England was still subject, the need for more architecture was very obvious. It ought to be the aim of the architectural profession to claim that the service it could render should be supplied in sufficient quantity to be available for all the building and town planning in the

country. It was a reproach to the architectural profession whenever they saw a badly built house or a badly laid out town. He did not say it was the fault of the architectural profession, as, of course, it had not been able to secure what it would like, but he was holding it up as an ideal that it was for the professional body to demand that arrangements should be made so that services which the profession could render to the community should be available in sufficient quality and quantity for all and not merely as a luxury for the richer classes.

MR. W. E. V. CROMPTON, in proposing a vote of thanks to Mr. Webb, said that matters of vital importance had been raised, and he felt that they were present at what might be a jumping-off meeting for a new and much more drastic policy than they had ever before felt it their duty to take up. Mr. Webb rather led them to think he did not know anything about architecture, but those who had read his criticisms in the *New Statesman* would realise that both he and Mrs. Webb had gone to the bottom of this question of vocational organisation.

MR. H. WIGGLESWORTH seconded the motion and pointed out the danger of the standard of architecture becoming lowered because one architect did not like to criticise another's work. The appointment of advisory councils, as suggested, would help to get over that difficulty. As ordinary practising architects, most of them felt that they did not get that same standard of work from the official architect as from the private architect. The official architect had not the same independent position, and could not advise with the same strength.

MR. MAURICE B. ADAMS said that in the articles Mr. Webb had written he suggested that the private architect had not extended to the salaried architect all the consideration he deserved, whilst he had that day urged the Institute to criticise their work. If they did that they would incur blame from Mr. Webb for being unjustly severe on the salaried architect. There had always been reluctance in the Institute to criticise some of the terrible things done for the Office of Works, because it was said they were jealous of the architects in Government service and, moreover, did not know the conditions under which they worked. If they had these advisory councils suggested for the first time by Mr. Webb, that invidious position might be largely remedied.

MR. H. V. LANCHESTER said it was distinctly encouraging that Mr. Webb had put before them three definite claims that they, as architects, could make, because they had just begun to nibble at those three claims. With regard to criticism, they had now and again made good their point, as in the case of Charing Cross Bridge. As regarded the point of their services being secured for the whole community, Government departments always had had the obsession that they must work by means of departmental staffs, and the same thing applied with respect to the local authorities. He would suggest whether, if there was a panel of the profession from which competent men could be drawn for special services, it would enable the profession to be enlisted for such service. He suggested the panel system, as many of them believed the departmental system was inconsistent with the genius of architecture.

PROFESSOR LETHABY said his only remark would be to urge the reciprocal view that the community should be a little more willing to accept the recommendations of architects.

MR. WEBB, in reply, said he agreed that the community had been as much to blame as the professions had fallen short, and they must try to make them both better. He did not think they would supply a sufficiency of architecture by any arrangement of a panel or anything of the sort. The reason why architecture was a luxury of the rich was that it was expensive. The only way of bringing luxuries within the reach of the poor was by making the poor cease to be poor, or by making the community pay for it, and it was in the latter way that they were dealing with the teaching profession. Architecture could be supplied in that way, but he was afraid it would lead in the direction of a departmental staff. He could not go into the subject of the departmental architect, but he did not know that the buildings put up by the London County Council department staff did not compare favourably with those erected by private engineers. It was quite possible that the way to get the highest play of architecture was to leave it as the plaything of the rich patron, but it had to be remembered that they had had great art under communal patronage. The Cathedral of Florence and much of the Greek work was produced by municipal effort, although it was not called municipal then. At that moment he was not looking at architecture as an art, but as a service to the community, and if they gave it as a service perhaps the art would look after itself. He knew the difficulty of criticising the art of a departmental architect, but why treat him as an artist at all? Why not criticise the architectural action of the Office of Works; its policy and its practice? A professional advisory council must not expect its advice to be taken. It was the business of a Minister to listen to advice and to take hints to aid his inside expert knowledge.

THE PRESIDENT pointed out that the Institute had been imposing its views on the Government with regard to the suggested housing programme, and architects would be allowed to do what they could for the poorer classes at the public expense, as the Government proposed to subsidise the schemes. He believed that criticism was the most valuable thing they could have. He was afraid they were exclusive, but he did not see how it could be avoided, as they wanted to see the professional association composed of competent men.

The next conference will be held on December 5th.

THE LONDON ASSOCIATION OF MASTER DECORATORS.

A meeting of the Executive Committee was held at the Secretary's Offices, 14, Queen Victoria-street, on the 5th ult. Mr. Stewart-Greene occupied the chair.

A report by representatives of the Joint Council was submitted on the question of wages, country money and the employment of disabled soldiers. With regard to wages, it was resolved to accept the recommendation of the Joint Council that the Association should become parties to Sir Wm. Robinson's awards of May 14 and October 25, 1917, so far as operatives engaged upon munitions work are concerned, whereby the rate of pay for such work has been increased by 1½d. per hour, thus bringing the rate up to 1s. 0½d. per hour (including bonus).

With regard to country money, it was pointed out that as it was understood that a movement was in progress by the Government to set up a Committee to deal with the wages question throughout the country, any attempt by the Association to settle in a formal manner the country money would be inopportune.

It was reported that a conference was about to take place between the Secretary of the Disabled Soldiers' Pensions Fund and the Joint Council, when the question of the better training of the soldiers would be dealt with.

The question of appointing a President, Vice-President, Council and other office-bearers for the ensuing year was considered, and following the course adopted by the National Association it is recommended that, during the present state of affairs in this country, the President, Vice-President and other office-bearers, as well as the Council, should be re-elected at the forthcoming general meeting, as it is not considered desirable or necessary to make any changes at present.

A draft annual report, as prepared by the Secretary, was considered; and, after amendment, was referred to the Secretary and Mr. Stewart-Greene to complete and issue.

The Plumbers' Company.

Mr. W. D. Caröe, F.S.A., has been re-elected Master of the Plumbers' Company.

GENERAL NEWS.

Houses for Barrow.

The first batch of houses to be erected in Barrow for munition workers will be on Roose-road, and a number of men are now engaged on the site. The contract for the first 200 has been let to the Creighton Construction Co., Ltd.

North Staffordshire Railway Company. Competition for Designs for Workmen's Houses.

The Competitions Committee of the Royal Institute of British Architects request Members and Licentiates not to take part in this competition, the conditions not being in accordance with the R.I.B.A. regulations for architectural competitions.

Rebuilding of Sackville-street, Dublin.

One of the first new buildings completed in Sackville-street, Dublin, since the calamity during Easter Week, 1916, has been opened. Messrs. Shortall & Co. erected the building, and also the mahogany shop fronts, which were made in their Dublin works. The plans, &c., were by Messrs. Bergin, C.E., and E. A. Smith, F.A.I.

Funeral of M. Rodin.

M. Rodin's funeral ceremony took place on the 24th inst., at Meudon, and was extremely simple and at the same time impressive. A catafalque was erected in front of the mausoleum in the park of the villa. It was draped in the three colours, and on the coffin were the insignia of the Legion of Honour and a Doctor's robe of Oxford University. The King was represented by Mr. George Grahame (Counsellor of the British Embassy), while Sir Lionel Earle and Sir Cecil Smith were present on behalf of the British Government.

Organising the Clay Industries.

An important conference to consider a proposed national council of employers for the clay industries has just been held at the Guildhall, London. The report of the Special Committee contained a scheme for the organisation of the clay industries, incorporating the principles of the Whitley Report, and it was this scheme, or some modification thereof, which the conference was invited to adopt, so that a temporary committee might be elected to carry out the suggested working arrangements. The discussion of the scheme was proceeded with in private, and a committee of twenty-five was appointed to put it into practical shape and carry it through.

National Housing Scheme.

Within the next few weeks the first steps will be taken in connection with the post-war National Housing Scheme. Official conferences, at which practically all the municipalities and urban and rural councils in England and Wales will be represented, are to be held in different parts of the country, including London, Manchester, Liverpool, Bristol, Norwich, Sheffield, and Newcastle-on-Tyne. Among the points now being considered by the Local Government Board are the following: The scope and character of the financial assistance which will be needed by local authorities in order to carry the housing schemes into effect; emergency legislation to provide for the acquisition at reasonable prices of land to serve as sites for schemes; the standards of lay-out, and the number of houses per acre; and the supply and cost of building materials. The housing campaign was, we believe, opened at Liverpool on the 28th inst., when building proposals, it was expected, would be agreed upon affecting over two hundred city, urban, and rural areas of the North-Western Counties of England and North Wales. The campaign is being organised by the National Housing and Town Planning Council. The President of the Local Government Board has arranged to receive a deputation of the Technical Conference set up by the National Housing and Town Planning Conference.

CORRESPONDENCE.

Housing of the Working Classes in England and Wales Cottage Competition.

SIR,—The attention of the Council of the Institute has been drawn to criticism of the conditions of the competition for working-class houses initiated by the R.I.B.A. on the ground that such conditions are in contravention of the Regulations for the Conduct of Architectural Competitions, inasmuch as no undertaking is given that the successful architect shall be employed to carry out the work.

I am directed by the Council to call attention to the following facts :—

1. The Local Government Board invited the R.I.B.A. to co-operate in the housing scheme by providing the best typical plans for cottages, which might be issued as a guide to local authorities and others in charge of housing schemes, to be used as instructions to the architects to be employed by them. An adequate sum of money is to be allotted as payment for these plans.

2. The Council consider that they have acted in the best interests of architecture in acceding to this request. They considered that the best way of procuring the designs was by means of a public competition, rather than by instructing a few architects to prepare them, especially in view of the fact that the great majority of architects are at present debarred from the practice of their profession.

3. Particulars of the designs asked for have been carefully prepared so that there should be no likelihood of their being used otherwise than as types showing the kind of houses that are required. The designs do not cover or provide for the varying conditions which will present themselves in actual housing schemes, nor do they touch the matter of lay-out, a very important part of the architect's functions. Moreover, it is the intention that a competent architect shall be employed in every scheme that may be initiated by public authorities.

4. The payment offered to the authors of the successful designs is adequate to cover the exceptional conditions.

5. If the present competition had carried with it the commission for execution of housing schemes, all architects now on service would have been precluded from taking part in such work when they are released from the Colours.

6. The entire circumstances are quite exceptional, and the Council see no objection to members taking part in the competition.

G. NORTHOVER.
On behalf of the Secretary R.I.B.A.

Building By-laws.

SIR,—Having very little time to spare, I abstained from replying to Mr. Chambers Smith, hoping that others would deal with the subject more thoroughly than I could.

But I should not like him to think that Mr. Voysey and Mr. Baillie-Scott are the only architects who recognise the stupidity of many of the building by-laws adopted by various local authorities.

I have not time to go through the pile of pamphlets which contain the by-laws of the various local bodies in this district, and which I have had to acquire and study from time to time as I was doing work in one or other of their districts. (Why there should be twenty different sets of by-laws for different parts of the same county is a puzzle, to start with.)

But I will mention one or two matters which occur to me "off-hand."

Cesspools.—In numerous cases, I have found by-laws requiring cesspools to be built of brickwork in cement and cemented inside so as to be watertight. Obviously a dry wall is not only as good, but much better for the purpose. Then some by-laws require, instead of the common-sense method of ventilation of cesspool and drain by two pipes, one of which is a continuation of the soil pipe, the isolation of the cesspool by a trap, so that the drain and cesspool are ventilated separately (but not so efficiently) at double the cost.

Wastes.—Some by-laws require traps on the waste pipes from baths or sinks, as well as open outlets. This is (under ordinary circumstances, where the fitting is close to the outer wall) again worse than useless, as it prevents the waste being cleansed by flushing or with a brush.

"*Ventilation*" *in Bedroom.*—Another silly requirement is the provision of a hole in the ceiling of a bedroom which has no fireplace. It would be interesting to see how many of these holes are left open after twelve months' use of the house!

No doubt these are small matters, and the total cost of them for a small house would be under £10. But, as I have pointed out, they are worse than useless, and the cost, if not wasted in this way, could be used in the provision of additional convenience in the fitting up of the house, or in the addition of some little feature of interest, say a doorhead for instance, which would give character to the building.

In some respects, I should like to see by-laws much more stringent; for instance, that only a certain number of houses should be allowed to the acre, and that all windows of dwelling-rooms should face south-east or west, and have an angle of light all round of, say, 160 degs. I frequently pass a block of houses (erected under by-laws) which, seen from the south, do not show a single window. The aspect of the block is south-west, but by a clever (?) disposition of the outbuildings, half the windows get no sun at all and the other half only in the summer evenings!

Generally the tendency of by-laws, specially in small districts, is to strain at gnats and swallow camels.

Bristol. J. H. LA TROBE.

Government and Housing By-laws.

SIR,—I am sorry I did not see Mr. C. Chambers Smith's letter *re* above. I can give examples of by-laws having been injurious—that is in making houses too costly—viz., at Coventry and Long Eaton, who require all rooms to be 9 ft. floor to ceiling, yet at Coventry the Council have built a quantity only 8 ft. high, but would not allow a builder this privilege. Last year I made alterations to an old house and wanted to raise ground floor, to be above street, and then it would be 8ft. 10 in., but was not allowed, although in next street to their own houses. Then, again, as to carrying-up division walls in roof, up to ceiling joist is ample, especially in semi-detached houses, as fire risk is nil.

In 4, 6 or 8-house blocks, carry-up every other wall, and that only 4½ in., and in walls where flues come, so involving little cost.

I notice in Coventry to-day blocks being built by Government for munition workers where such division walls measure 17 yds. of 9 in., worth some £5. This would be far better spent in fitments. Again, let walls of a larder, coals and w.c., where built out from main wall, be only 4½ in., but built in cement and mortar, saving cost and space.

My observation is that such out-buildings are useful because they prevent gossiping and give more privacy. A scullery should not be built out unless frontage is a lot more than the usual 12 ft. and 13 ft. in Coventry, which gives a yard some 4 ft. wide; making the living room dark and dreary, and even worse if bedroom over scullery. As to stairs and height of rooms, one I saw to-day with rise of 8½ in. and tread of 6½ in., which is unsafe; if been 8 ft. room, three steps might be saved, making an improvement.

As to new streets, 28 ft. wide is allowed in houses set back in a residential street, and ample too; saves cost of road-making and gives more garden to tenant. But why have to fix a granite kerb 12 in. by 6 in.? What money thrown away. Cement kerbs, which other councils adjoining are allowing, are much cheaper. Use granite at corners of street by all means.

I am pleased to see that by-laws are to be ignored in the Government Housing Competition, but would not it be better if prize money was divided up more, say, give three or four equal sums for best plans, which may be equally good when applied to different localities? No one plan can be universally adopted.

What we want is cheaper land. As an instance, I was recently asked £830 an acre for land on city boundary; owner had no roads, drains, or fences to make. This land as a grazing field he might get £3 an acre rent, which at a 4 per cent. value equals £75 an acre. Should this be allowed? Councils should be able to commandeer such at, say, 100 per cent. increase; one could afford garden land then. Other land near to £1,200 and £1,400 per acre is being asked. T. W. COVENTRY.

[*** This letter no doubt expresses in a characteristic manner the dissatisfaction felt by the average man with the building by-laws in force.—EDITOR.]

Architects' War Committee.

SIR,—My predecessor in the chair at the Institute, Mr. Ernest Newton, has, as chairman of the Architects' War Committee, just issued an appeal for funds which are necessary if certain most important and useful aspects of the work of that Committee are to be continued. I need not, I feel, at the present time go into the reasons, which must be clear to everyone connected with building, for the necessity of such a fund. It is sufficiently well known that the hardship incurred by many members of the architectural profession has been serious. The fund, which was raised at the beginning of the war, is now completely exhausted and it will be impossible to continue the work of subsidised employment and other means of assistance which are now being afforded unless Mr. Newton's letter meets with the liberal response it deserves.

I should therefore like to associate myself with his appeal and urge upon members of the Institute and others to come to our aid in a difficult time. Unless this is done and fresh contributions are forthcoming, the effect will be very seriously felt by many architects who deserve all the sympathy and support of their professional brethren.

All contributions should be addressed to Mr. Newton at No. 9, Conduit-street, W. 1.

HENRY T. HARE,
President R.I.B.A.

MEETINGS.

MONDAY, *December* 3.

Royal Society of Arts.—Prof. H. C. H. Carpenter, M.A., Ph.D., M.Inst.M.M., on "Progress in the Metallurgy of Copper" (Lecture I). 4.30 p.m.

Royal Institute of British Architects.—General meeting (Business), 3 p.m., to be followed by a special meeting to consider the question of Building after the War, with special reference to the question of official permits.

Society of Engineers (at the Geological Institute, Burlington House, Piccadilly).—Mr. Chalmers Kearney, on "High-speed Railways after the War." 5 p.m.

TUESDAY, *December* 4.

London University College.—Professor S. D. Adshead, M.A., F.R.I.B.A., on "Housing Problems after the War" (Lecture V). 5 p.m.

Incorporated Institute of British Decorators.—General Council Meeting. 6.30 p.m.

WEDNESDAY, *December* 5.

Royal Archaeological Institute (in the Apartments of the Society of Antiquaries, Burlington House, Piccadilly). General meeting. 4.30 p.m.

Royal Society of Arts.—Inaugural *Trueman Woodby* Lecture; Sir Dugald Clerk, K.B.E., D.Sc., F.R.S. 4.30 p.m.

Book Received.

PRACTICAL MATHEMATICS FOR TECHNICAL STUDENTS. By Edward L. Bates and Frederick Charlesworth. Second edition. (London: B. T. Batsford. Ltd. 5s. net.)

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ILLUSTRATIONS.

Shrewsbury School: New Library.

SHREWSBURY, while occupying one of the foremost positions in the historic schools of England, and made famous in its learning by its roll of illustrious men, from Sir Philip Sidney to Darwin, possesses a valuable library.

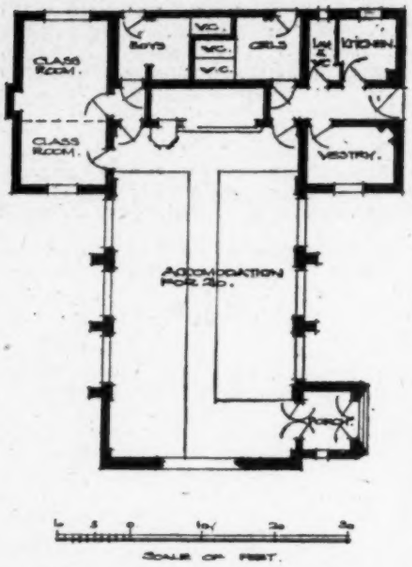
The collection numbers upwards of 6,000 volumes, mainly rare and ancient books, of which many were printed before 1500.

The school was moved in 1882 from the well-known seventeenth century stone buildings in the town to the present premises at Kingsland. A fire threatened to destroy the library towards the end of the last century; since that event the desire for a detached building has engaged the attention of the governing body.

By the generosity of Mr. Moser, one of the masters at the school, and after whom the new buildings are named, the new library has been erected, and with it are embodied a hall or museum, a reading room, and picture gallery. This latter room is intended to contain ultimately an exquisite collection of English water-colour drawings, whilst affording opportunities for special periodical exhibitions. A loggia on the north side gives a splendid outlook upon the river, for which Shrewsbury is famous.

The design is based upon the traditional character of the old school building. Internally, advantage has been taken of securing open roof effects consistent with the proportions and other claims of the respective departments. All the visible roof timbers and all joinery are of English oak. Collier's Reading bricks are used with Grinshill stone upon the exterior, and the roofs of the structure are covered with Caddick's hand-made Staffordshire tiles.

Mr. Price, of Shrewsbury, was the builder, and Messrs. Forsyth & Maule the architects.



Wesleyan School Chapel, Streetley.

Technical School, Sutton Coldfield.

This school is built on a sloping site in the Lichfield-road, and the accommodation comprises (in addition to rooms shown on the plan illustrated), workshops in basement and a large art room on the upper floor lighted from the rear. Messrs. Crouch, Butler & Savage, FF.R.I.B.A., were the architects.

Elementary School, Sutton Coldfield.

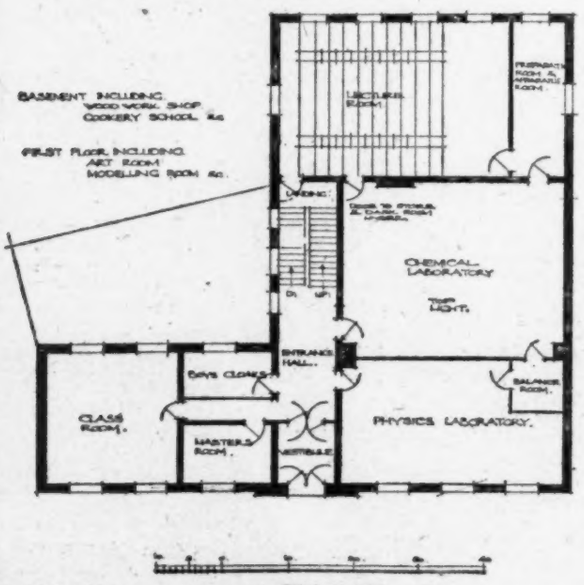
These schools were built some years ago on a sloping site in the centre of the town. Materials used were grey Staffordshire bricks and Hartshill tiles. Messrs. Crouch, Butler & Savage, FF.R.I.B.A., were the architects.

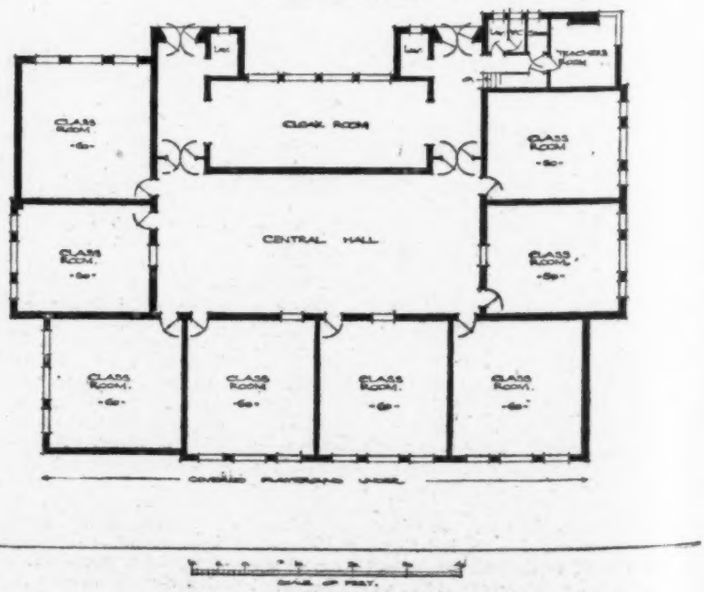
Wesleyan School Chapel, Streetley.

This school chapel will eventually be used as a Sunday school, when the church is built on the remainder of the site. The materials are Ginting stone and Westmorland slates. Messrs. Crouch, Butler & Savage, FF.R.I.B.A., were the architects.

The illustrations of Cromwell House, Highgate, are referred to in the next column.

GROUND PLAN OF BOYS SCHOOL, SUTTON COLDFIELD.





Technical School, Sutton Coldfield.
MESSRS. CROUCH, BUTLER & SAVAGE, ARCHITECTS.

CROMWELL HOUSE, HIGHGATE.

Mr. Philip Norman has written an excellent little monograph* on the fine old house now used as a convalescent home in connection with the Sick Children's Hospital in Great Ormond-street. The history of the house is veiled in much obscurity, and even the skill and insight of the author are unable to solve many conjectural points. The association with the Protector suggested by the name was first mentioned in print about sixty years ago, and rests on a most uncertain foundation, such as the vague statement in Prickett's "History of Highgate," published in 1842, which is to the effect that the house is supposed to have been built by Cromwell as a residence for his son-in-law, General Ireton, and is evidently built and decorated internally in accordance with the taste of its military occupant. The last suggestion rests on no more certain evidence than the fanciful military figures which surmount the newels of the staircase (see our inset plate), and which are far more likely to be the outcome of the fancy of the craftsman employed. Other evidence, equally untrustworthy, is afforded by certain initials over a chimney piece and on a garden wall. The remaining strands of a flimsy web of conjecture are afforded by claims made after the Restoration for the recovery of certain lands in Highgate which had been granted to Ireton by the Usurper. The house was owned by the Sprignell family, who were connected with Highgate for several generations, and one of whom married a daughter of Gideon de Laune, one of the first Masters of the Society of Apothecaries and Apothecary to Anne of Denmark. Richard Sprignell, the husband of Anne de Laune, was a Governor of Highgate School in 1639, and in his will mention is made of a field called Hornsey-lane Field, which was near Cromwell House, and on part of which the house may have stood. On the ceiling of the principal room the Sprignell arms occur, so there is strong evidence that the house was built by a member of the family. Architecturally, the house is a very fine example of the period, and though it suffered from the effects of a disastrous fire in 1865, in which it narrowly escaped destruction, and the ceilings of the first floor had to be removed, it was very carefully restored and now remains very much what it was formerly.

The little monograph is admirably produced, and is illustrated by a series of fine photographic views, two of which we reproduce in our inset illustrations.

* "Cromwell House, Highgate: Its History and Associations." By Philip Norman, LL.D., F.S.A. (London: John Murray.)

BOROUGH OF SUTTON COLDFIELD TECHNICAL SCHOOL.
MESSRS. CROUCH, BUTLER & SAVAGE, FF.R.I.B.A., ARCHITECTS.

ELEMENTARY SCHOOL, SUTTON COLDFIELD.

MESSRS. CROUCH, BUTLER & SAVAGE, FF.R.I.B.A., ARCHITECTS.

Photo: Thos. Lewis.

SHREWSBURY SCHOOL: READING ROOM IN MOSER BUILDING.
MESSRS. FORSYTH & MAULE, FF.R.I.B.A., ARCHITECTS.

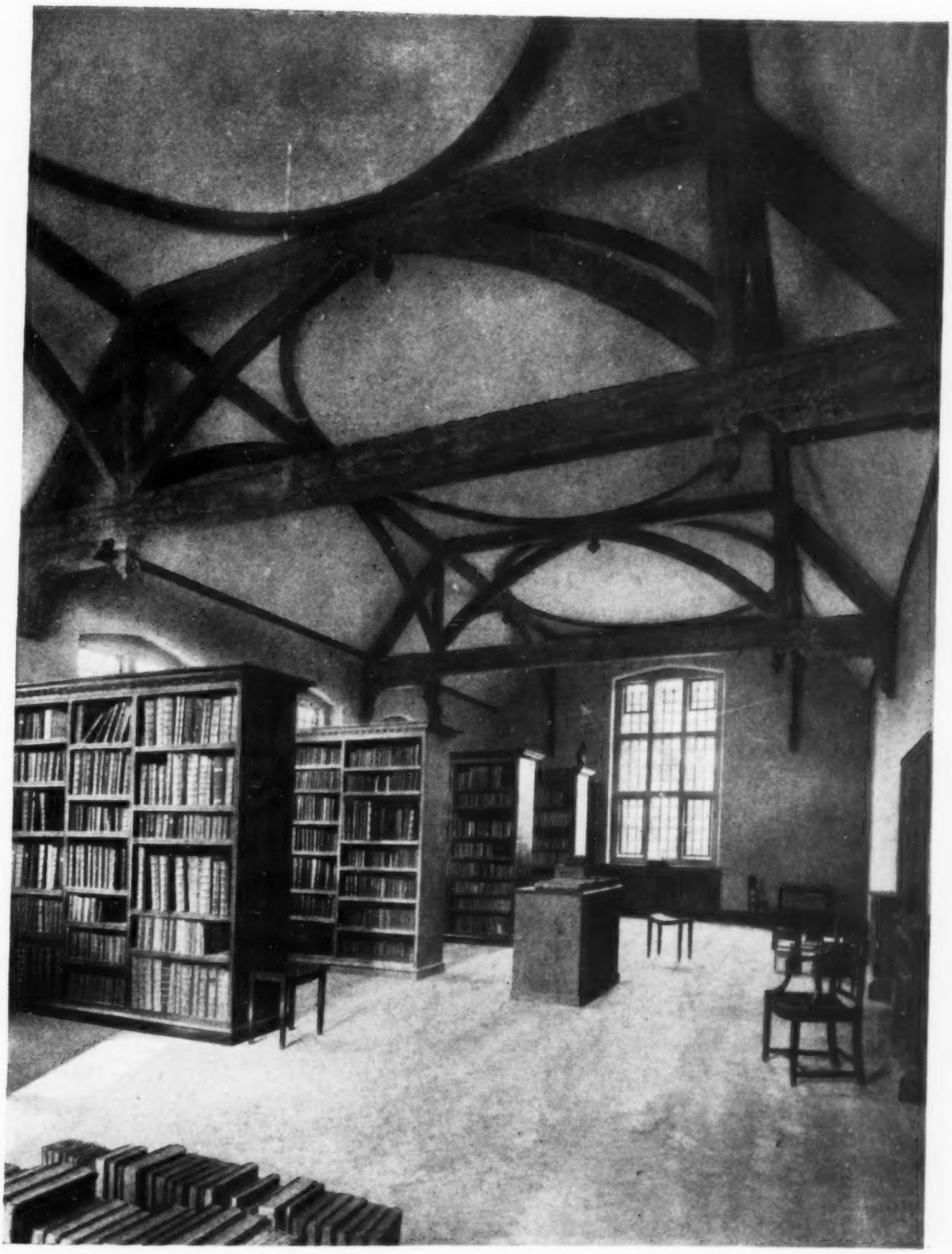
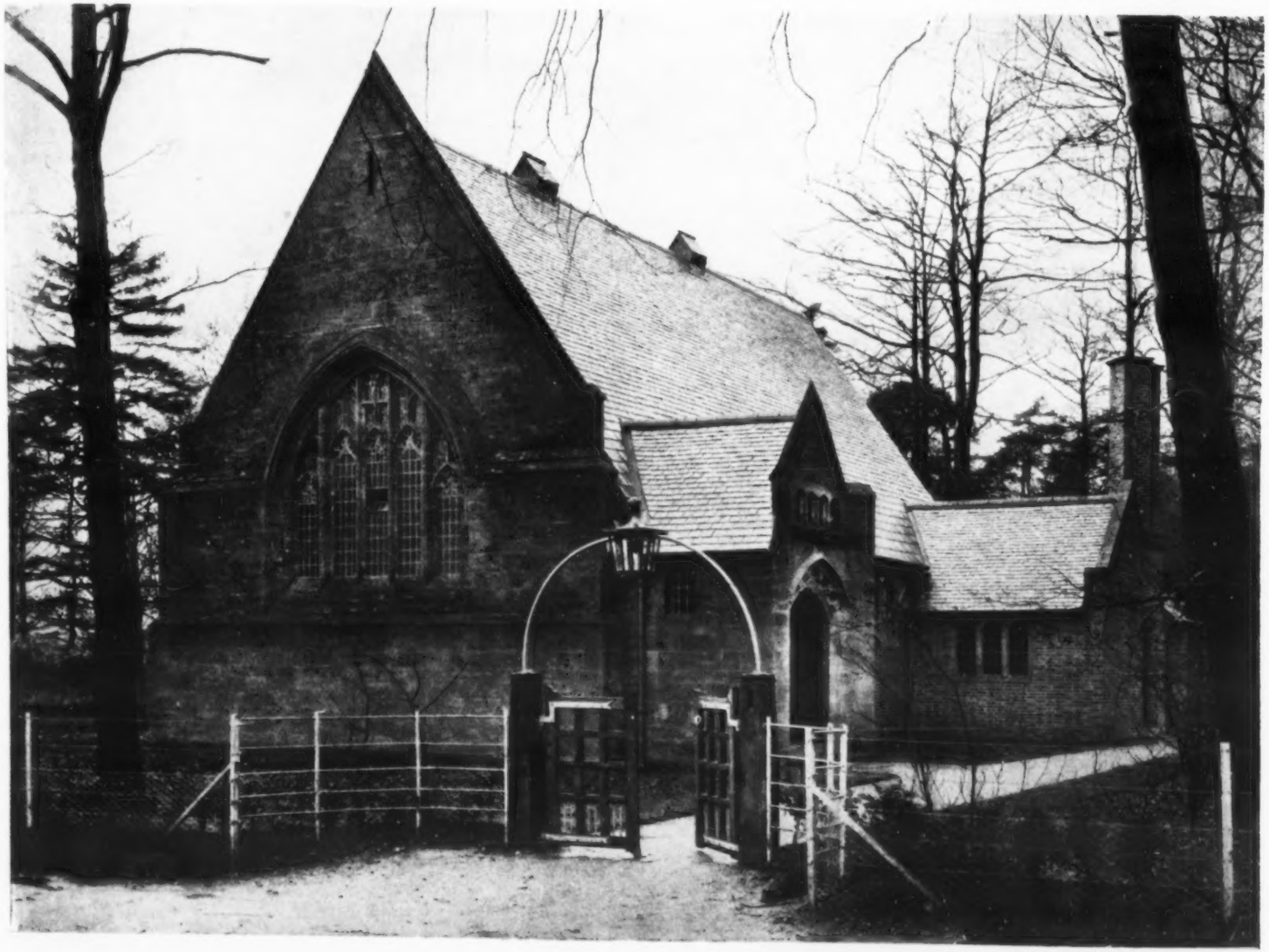


Photo: Thos. Lewis.

NEW LIBRARY, MOSER BUILDING, SHREWSBURY SCHOOL.
MESSRS. FORSYTH & MAULE, FF.R.I.B.A., ARCHITECTS.



WESLEYAN SCHOOL CHAPEL, STREETLEY, SUTTON COLDFIELD.
MESSRS. CROUCH, BUTLER & SAVAGE, FF.R.I.B.A., ARCHITECTS.

Photo: Thos. Lewis.

STAIRCASE.

FRONT TO HIGHGATE HILL.

CROMWELL HOUSE, HIGHGATE.

From "Cromwell House, Highgate," by PHILIP NORMAN.

RECENT EXPERIMENTS IN VENTILATION.

THE following is the continuation of Mr. A. H. Barker's paper on "Recent Experiments in Ventilation," part of which was given in our last issue :—

The main objects of these experiments have been not only to verify these conclusions on a practical scale, but to compare the effect of specific physical conditions of air in a room on subjects exposed to them, and the determination of figures representing exactly the qualities of the air as well as means which will enable these qualities to be certainly recognized.

Experimental rooms have been equipped with apparatus which will enable any precisely defined condition as to temperature and humidity and air movement to be maintained for an indefinite period, and to be altered and adjusted at will. Suitable subjects have been obtained and subjected to these conditions, and means devised to measure the effect of the condition on the subjects exposed to them.

I shall describe in a moment the methods which have been adopted in order, so far as possible, to measure quantitatively the effect on a human subject. The fact must again be emphasized that in the nature of things all such experiments can only be carried out for a certain limited period, and that that period cannot be sufficiently protracted to make the experiment really decisive in regard to its ultimate effect. It might well be that some of the subjects of these experiments, years after the experiments themselves were concluded, might develop some prejudicial effects as a direct consequence of their experiences during such experiments as these. All such ultimate results would be entirely unknown to the present experimenters, and even to the subject, but there is no present evidence of such prejudicial effects.

If the theory is sound, it would follow at once that the air of a room need not be changed to anything like the extent which has been thought necessary in good practice in the past; that the same air can be used over and over again so long as its physical condition of temperature, humidity, movement and smell can be controlled. To test this in a practical manner was the object of experiments devised by Professor Bass, of the University of Minnesota, Minneapolis, and described in the "Transactions of the American Society of Heating and Ventilating Engineers, 1913."

The experiment was devised in order to test the question whether a much smaller amount of recirculated air than is usually supplied per head would not suffice for perfectly adequate ventilation, provided this air was supplied to the subjects at a suitable temperature, humidity, movement, and free from smell.

Two exactly similar schoolrooms were selected. One was fitted out for recirculating the air of the room over apparatus specially designed to keep the moisture and the temperature both as constant as possible within limits, and to wash it and deodorise it by means of ozone. This air so treated was then again introduced into the room in very small quantities immediately in front of the face of the pupil sitting at his desk. The effect on the pupils was noted both physiologically and psychologically, and compared with the corresponding effect in an exactly similar school occupied by an exactly similar class of pupil, ventilated on the ordinary system with a large amount of fresh air. I show the types of orifice adopted for blowing the air in a gentle stream round the heads of the pupils at a velocity of about 18 ins. per second. The children were each supplied in the one case with 500 cubic feet of recirculated air per hour gently blown into their faces, and in the other with 1,800 cubic feet of fresh air per head per hour supplied in the usual manner through one grating in the wall. On both groups observations were taken extending over a fortnight similar to those described in detail on the next series of experiments.

It is impossible in the time at my disposal to explain in detail the methods of comparison adopted. The broad experimental results are shown in diagram form, from which it will be seen that such very slight differences as were observed between the two groups were in favour, if anything, of the recirculated air rather than the fresh air. The significance of this would be not, of course, that recirculated air is better than fresh air, but that the slight movement in the recirculated air is of greater value than the greater degree of freshness of the air supplied to the control group.

All these conclusions are, perhaps, of greater importance in a country where the normal temperature is lower than here. The chief object of recirculating the used air of a room in preference to introducing fresh air from the outside is to save the great loss of heat which free ventilation causes. There is a certain quantity of heat necessary to warm the incoming air to a suitable temperature. All this heat is carried away by the outgoing air. In countries such as America, where the difference between the inside and outside temperature is great (70 degs. or more), the importance of this saving is obviously greater than here, where a difference of 30 or 35 degs. between inside and outside is the limit contemplated.

The next experiments calling for description were made by the New York State Commission on Ventilation. These experiments were made to compare the effect on groups of subjects of the following physical conditions :—

Condition 1. Air temperature 86 degs., relative humidity, 75 per cent., with ample air supply. The air being agitated by fans.

Condition 2. 86 degs. temperature; 75 per cent. relative humidity; no air supply; air stagnant.

Condition 3. 68 degs. temperature; 50 per cent. relative humidity; ample air supply.

Condition 4. 68 degs. temperature; 50 per cent. relative humidity; no air supply.

This was the intention of the observations, but, unfortunately, it was found that the condition of constancy for Condition 4 could not be maintained. The temperature could not be kept down to the desired point without also reducing the humidity below the desired value. There were, therefore, only three conditions the effect of which it is possible to compare, namely, the first three.

I can only describe the tests which were made on the subjects, both physiological and psychological, and the bare outline of the results secured by two years' work. Physiological observations were made on the following points :

1. Body temperature. The normal body temperature is closely 98.7 degs. F. It is well-known that any condition which causes rise of body temperature is undesirable, though to what extent exactly it is to be regarded as undesirable it is difficult to say.

2. The rate of respiration. The normal rate of respiration for a person in good health is about 16 or 17 per minute. Undesirable conditions will send up this rate, the increase representing nature's effort to adjust the body mechanism to the undesirable environment. If, therefore, any set of conditions send up the respiration rate it is *prima facie* evidence that such conditions are undesirable.

3. Next we have the pulse rate, to which similar observations apply. The average pulse rate is about 72 beats per minute. An unduly high rate is an indication that something is wrong. If a person is set to hard work, the effect will always be an increase in the pulse rate, which rate will decline more rapidly the better the conditions. Further, the difference between the pulse rate when a person is reclining and when he is standing is also an indication of suitability or otherwise of the conditions—the greater the increase of pulse rate when a person stands, the less suitable the conditions may be taken to be.

4. Next there are observations on blood pressure, which have a certain physiological significance which it is difficult for the lay mind to understand altogether. The effect on the blood pressure of a change from a reclining to a standing position is also of importance.

Physiologists have devised an arbitrary scale, first proposed by Dr. C. Ward Crampton, and known as the "Crampton Value," which affords a measure of vaso-motor tone. It expresses as a percentage the relation between the change in the pulse rate and the blood pressure on rising from reclining to a standing condition. A high value in this scale indicates a good tone or tension in the circulatory system with a slight tax on the heart.

Perfect conditions, which are called 100 per cent. on the Crampton Scale, would be those in which the pulse rate on standing increases less than five beats, the normal rate being perhaps 70, while the blood pressure increases by 10 millimetres of mercury, the normal being perhaps 110.

The zero value on this scale, that is the very worst possible, would be represented by an increase of 40 beats in the pulse rate on rising from reclining to standing, with a corresponding drop in blood pressure of more than 8 millimetres.

It will be seen that this highly artificial value is a technical measure of condition, and that a given set of air conditions which produces a low value on the Crampton Scale is undesirable.

Psychological Tests.—In addition to these purely physiological measurements, the scientists endeavoured to set up some psychological tests, that is, tests showing the effects on the mental powers of a subject. If the conditions are good, the presumption is that the person's mind is maintained relatively alert and active. Bad conditions may be assumed to cause the mental faculties to be dull or inert or sluggish. The tests devised to indicate the mental condition of the subjects were as follows :—

The subject was asked :

1. To name as rapidly as possible 100 different patches of colour on a diagram placed before him.

2. To name the opposites of 100 words given to him.

3. To cancel certain digits from a sheet filled with numbers.

4. To add columns of figures.

5. To multiply mentally a number of three digits by a second similar number, the final result only to be recorded on the paper.

6. To copy on the typewriter certain extracts from a selected book.

From ten to thirty minutes were devoted to each of these tests.

It was assumed that if a subject showed himself more active in one set of conditions than in another, that set was the most desirable.

Comfort Tests.—Also the subject was invited to state his opinion as to his physical comfort on the following scale :—

1. I feel as uncomfortable as I would with a severe headache or an attack of influenza.

2. My condition is about half way between 1 and 3.

3. I feel about as I usually do at the close of an afternoon of hard mental work.

4. My condition is half way between 3 and 5.

5. I feel as comfortable as I ever do.

Food Consumption.—A further test which was made consisted in observing the amount of food consumed by persons under the various conditions. The food was supplied to them as an ordinary lunch of uniform quality, and they were invited to take as much as they wanted, and observations were taken of the quantity of food eaten.

Voluntary Test Work.—A test was also made of the accomplishment of voluntary physical work. The subjects were offered considerable sums of money at "piece rate" for the performance of certain work. They were allowed to do as much or as little of this work as they felt inclined, and the amount of work was carefully watched. It was assumed that the amount of work voluntarily done under certain physical conditions was a measure of the value of the conditions.

It will thus be seen how excessively artificial the tests must be in order to reduce the effect on the human subject to a numerical scale.

I will now give a general summary in the form of diagrams of the results of these experiments. (1) Taking the body temperature as a criterion, the diagram on the screen shows the result of the calculation of a very large number of

averages. It shows clearly that the temperature rises and falls exactly according to the surrounding temperature; and in so far, therefore, as a rise in body temperature is undesirable, just in so far is a rise in surrounding temperature also undesirable. (2) Equally it is shown that the pulse and respiration are on the average increased by a high temperature, the blood pressure is less, that the Crampton value is higher invariably for the lower than for the higher temperatures.

The psychological tests do not show any very considerable difference between the two conditions. The mental activity is practically the same in the two extremes.

The food consumption is invariably greater the lower the temperature.

The inclination to work responds to the temperature in an inverse sense.

Such in general is the result of these very elaborate series of tests. So far as such a comparison can go it proves the contention of the modern physiologist that it is the physical condition of the air and not at all its chemical condition which determines the suitability of its qualities. It shows not only that of two specific conditions 68 deg. and 50 deg. humidity is far more suitable than 85 deg. and 75 per cent., but generally how it is that the higher values react unfavourably on the physiological and psychological well being.

Odour.—In regard to odour, one of the most difficult measurements to take in regard to the condition of a room is the degree and offensiveness of the odour arising from the ordinary occupancy of a room. Here the difficulty is that an immeasurably small amount of odorous vapour is easily observable by the human nose. It is not possible entirely to suppress odour otherwise than by immediately removing its cause or removing the vapours which cause it by interchanging the air with other air, or alternatively by deodorising the air by introducing suitable chemicals into the washing water. The introduction of ozone has a marked deodorising effect. Recent experiments, which I have no time to explain, have shown that the use of ozone can completely destroy very unpleasant organic odours, such as those arising from the manufacture of glue or other offensive operations, and that this destruction is not merely due, as it was at one time believed by many people, myself included, to be due, to masking one odour by another more pungent, but it is due to the destruction or oxidation of the vapour which causes the odour. There are chemical deodorisers which can be used with the washing water which have a similar effect—permanganate of potash among the number.

The experiments previously described indicate two facts of great importance: (1) That a person feels warmer in a room when the humidity is high, than in the same room at the same temperature when the humidity is low. (2) They also indicate that one of the chief considerations in ventilation from the point of view of present well-being are the temperature, humidity and air movement, rather than chemical purity.

It is at least probable that the physiological explanation of these facts is that each of these three factors has an effect on the amount of heat which the body will lose. If then we can show that, whatever the value of the individual factors may be, the conditions are equally comfortable if *the combination of values* of these three factors produce jointly the same net rate of abstraction of heat from the body, we shall have gone far to prove definitely that comfort depends on rate of heat abstraction. Conversely, if we can determine those combinations of conditions which will produce a desirable rate of heat abstraction, we can determine what combination is suitable without reference to the variable feelings of the subject. We can reduce the whole problem to one objective variable, namely, the rate of heat abstraction. At present, criticism of the ventilation of a building may be perhaps that it is stuffy or draughty, or stagnant or oppressive. To speak in more scientific language, we may say that the thermometer was too high or the air was too moist, or that the velocity of the air in the room is too high, or that the conditions do not suit this or that class of persons.

LAW REPORTS.

Contracts and the War.

Metropolitan Water Board *v.* Dick Kerr, & Co.

The Law Lords have decided that Messrs. Dick, Kerr & Co.'s contracts for the construction of reservoirs near Staines for the Metropolitan Water Board were at an end when the Minister of Munitions ordered the company to cease work and place their labour, plant and materials at his disposal for war work.

The case came before the House of Lords on an appeal by the Water Board.

COURT OF APPEAL.

(Before Lords Justices PICKFORD and BANKES and Mr. Justice SARGANT.)

Architect's Action.

Duff *v.* Ammonia Soda Co., Ltd.,

This case came on for hearing recently upon the cross appeal of the parties from the verdict and judgment entered at the trial before Mr. Justice Darling and a special jury.

The plaintiff, Mr. Edward Jas. Duff, an architect and engineer, brought the action against the defendant company to recover damages for the alleged breach of two contracts, dated Oct. 29th, 1914, and Aug. 5th, 1915.

Mr. Holman Gregory, K.C., in support of Mr. Duff's appeal, explained that the point involved in the case, so far as he was concerned, was on what amount of work Mr. Duff was entitled to architect's fees of five per cent. Mr. Duff, besides being an architect, was also a consulting engineer and specialist in chemical plant. He was employed under an agreement with the defendant company to reconstruct their works, for which he was to receive a salary or remuneration of £1,200 a year. In addition to this, the company had another agreement with him by which he, as consulting engineer and architect, was to design and supervise some new work, and in respect of that he was to receive a fee of five per cent. on the cost. The company put an end to these two agreements on January 26, 1916, and their case was that they were entitled to do that upon the ground that Mr. Duff, who was a director of the company, had been party to alleged frauds committed by the directors of the company, which was, however, emphatically denied. The company alleged that they had justification for the dismissal, and the issue upon the point was decided by the jury, who found in favour of Mr. Duff. In order to have a clear issue to go to the jury, it was agreed that if the liability of the defendant company was established the question of amendment on all other issues should be referred to another tribunal. So the evidence given on behalf of Mr. Duff was confined to that one issue. At a later stage Sir John Simon, who then represented the defendants, and he (Mr. Gregory) said they would like to have the learned Judge's interpretation of the architect's fees, and whether Mr. Duff was entitled to be paid on one amount or another. He (Counsel) said that that could not be decided by the Judge without his hearing the evidence. But the Judge gave his judgment in one sense in Mr. Duff's favour, and that he was entitled to five per cent. on £50,000 worth of work. Mr. Duff alleged that he was entitled to five per cent. on £200,000 worth of work, and the company now appealed upon the ground that the Judge was wrong in deciding that Mr. Duff was entitled to five per cent. on £50,000 worth of work. He (Counsel) contended that the learned Judge was not in a position to decide effectually that point without some further evidence being called before him, but that taking the evidence as it stood before him he was wrong in the construction he had arrived at. Mr. Duff's work related to the designing of plant for the making of nitrate of lime, the original expense of which plant was to be partly borne by the Ministry of Munitions. Lord Moulton had paid several visits to Cheshire in connection with the project.

Mr. J. B. Matthews, K.C., on behalf of the defendants, contended that the letter which the company received from the Ministry of Munitions on December 30th, 1916, forbidding the company to proceed with the work, had the effect of concluding the contract between the company and Mr. Duff as from that date, and therefore that the utmost the plaintiff could claim from the company was commission at the rate of five per cent. on the expenditure up to that date.

In the result their lordships, in a considered judgment, came to the conclusion that the plaintiff's appeal must be allowed, as Mr. Justice Darling had directed the basis of commission without having a sufficiency of material upon which to work. They dismissed the cross appeal, and the plaintiff was given the costs of the appeal, and the question as to the assessment of the damages was referred to an official referee.

THE LONDON COUNTY COUNCIL.

THE fortnightly meeting of the London County Council was held on Tuesday in the County Hall, Spring Gardens, S.W., the Marquis of Crewe (Chairman) presiding.

Brady-street Area.—It was reported that on July 3, 1917, the Council, in connection with the approval of estimates of expenditure for housing purposes during 1917-18, referred it to the Housing of the Working Classes Committee and the Finance Committee, "to consider and report as to the submission of a supplemental estimate of £5,000." The service which this reference was intended to cover was the clearance of the insanitary area known as the Brady-street area, Bethnal-green.

The Housing of the Working Classes Committee have reconsidered the whole question, and in view of the difficulties arising out of the war, notably the restriction of expenditure on capital account, they have come to the conclusion that there is no prospect of the necessity arising this year for the submission of a supplemental estimate of expenditure as indicated in the reference.

List of Rates of Wages and Hours of Labour in Building Trades.—It was agreed that the Council's list of rates of wages and hours of labour be amended by the addition of the following to the existing footnotes relating to the payment of war wages, except that to the trade of glaziers, under the heading of "Building Trades": "and when working on munitions work to a further war wages advance of 1½d. an hour."

OBITUARY.

Mr. Andrew Roberts.

We regret to announce the death on the 18th inst. of Mr. Andrew Roberts at his residence, 2, Trevanion-road, West Kensington. Mr. Roberts was a native of Montrose, N.B., and was in his 74th year. In 1875 he entered the employ of Mr. Lovatt, of Wolverhampton, and in 1896 came to London as manager for him. He superintended the erection of the Carlton Hotel, Her Majesty's Theatre, Salisbury House, FitzGeorge Avenue, and many flats and other buildings. In 1906 he founded the business of A. Roberts & Co., Ltd., of 74, Earl's Court-road, W., and remained managing director of it until his death.

A Liverpool Architect's Bequests.

Amongst the bequests of Captain Matthew Henan, F.R.I.B.A., First Battalion South Lancashire Regiment, of Liverpool, was £12,000 to the Roman Catholic Archbishop of Liverpool to be devoted to the erection, completion and decoration of a church in the Byzantine style, modelled on St. Benedict's, Warrington, as a memorial to himself and his family. He also left £4,000 to the Liverpool Catholic Blind Asylum, and £1,000 to Liverpool Architectural Society for scholarships. The net personalty amounts to £50,718.

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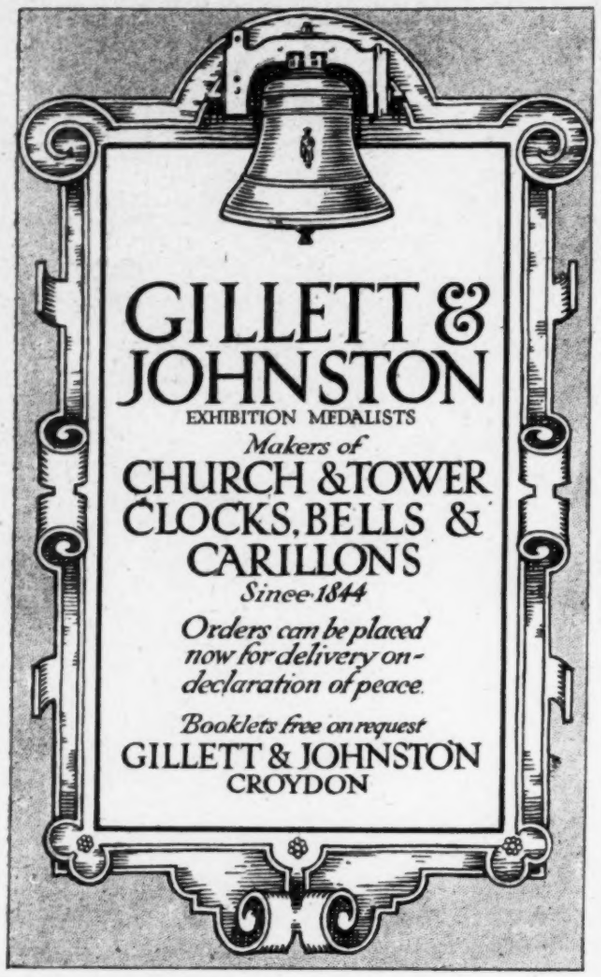

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Competitions, Contracts, &c.

For some contracts still open, but not included in this List, see previous issues. Those with an asterisk (*) are advertised in this number. Contracts, —; Tenders, —; Public Appointments, xx; Auction Sales, xxi, Certain conditions beyond those given in the following information are imposed in some cases, such as that advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bona-fide tender unless stated to the contrary.

BUILDING AND PAINTING.

DECEMBER 3.—**Windsor.**—WALL.—The R.D.C. invite tenders for erecting a wall, &c., at the Council's yard at Clewer. Plan and specification can be seen at the Council's Yard. Mr. J. E. Gale, Clerk, 3, Sheet-street, Windsor.

*DECEMBER 5.—PAVILIONS.—The Red Cross Society invite tenders for open-air pavilions at institutions in Derby, Birmingham, Bristol, St. Helens, Southampton and Exeter. Contractors must send in their names to Brook Kitchin, Esq., F.R.I.B.A., Architects' Department, Local Government Board, Whitehall.

NO DATE.—**Dundee.**—ALTERATIONS, &c.—Dundee Combination P.C. invite tenders for alterations on drains, sanitary improvements, &c., at Ashcliffe Children's Home. Applications to Mr. T. Martin Cappon, F.R.I.B.A., 32, Bank-street, Dundee.

NO DATE.—**Nantymoel.**—PAINTING.—For painting and repairing 19 houses in Nantymoel. Particulars of Mr. Evans, Glanwyre, Grange-street, Port Talbot.

FURNITURE, MATERIALS, etc.

DECEMBER 5.—**Manchester.**—LIME, &c.—Supply to the Cleansing Committee of the Manchester Corporation for twelve months of lime, glass, lead, &c. Particulars of Mr. Robert Williamson Superintendent of the Cleansing Department, Town Hall, Manchester.

NO DATE.—**Trimdon.**—TIMBER, &c.—Supply to the Trimdon Coal Co., Ltd. of timber, &c. Forms of Mr. T. Penney, Deaf Hill Colliery, Trimdon Grange, S.O.

ENGINEERING, IRON AND STEEL.

DECEMBER 3.—**London.**—RADIATORS.—Supply to the Commissioners of His Majesty's Works, &c., of radiators (during a period of six months from date of acceptance of tender). Forms of the Controller of Supplies, H.M. Office of Works, &c., King Charles-street, Westminster, S.W. 1.

DECEMBER 12.—**London.**—ENGINEERS' WORK, &C.—The Holborn Guardians invite tenders for engineers' work, &c. Forms of Mr. H. Granger Holder, Clerk to the Guardians, 53, Clerkenwell-road, E.C.

ROAD, SANITARY, AND WATER WORKS.

DECEMBER 3.—**Broadstairs.**—GRANITE MACADAM.—Supply to the Broadstairs and St. Peter's U.D.C. of 200 tons of granite macadam, broken to a 2 in. gauge, delivered to the Town Depot, Grosvenor-road, Broadstairs. Form from Mr. H. Hurd, C.E., Town Surveyor, Council Offices, Broadstairs.

DECEMBER 8.—**Teddington.**—GRANITE.—Supply to the U.D.C. of 500 tons of broken granite, more or less, as may be required. Forms from Mr. Marshall Hainsworth, Surveyor, Public Offices, Teddington.

DECEMBER 12.—**Trowbridge.**—ROAD MATERIAL, &c.—The Roads and Bridges Committee of the Wilts. C.C. invite tenders for a period of one year, commencing the 1st day of April next for the following:—Granites, basalts, limestones, flints, &c.; Hauling—piecework and daywork; steam rolling; tools for roadwork; tar for tar-spraying. Specifications, &c., from Mr. J. George Powell, County Surveyor, County Surveyor's Office, Trowbridge.

DECEMBER 14.—**Reading.**—ROAD MATERIAL.—Supply to the Berkshire C.C. of broken road materials, gravel and sand for the twelve months ending March 31st, 1919. Form of Mr. A. Langston Yockney, Acting County Surveyor, Surveyor's Department, Shire Hall, Reading.

Auction Sales.

*DECEMBER 4.—**London.**—Mr. Henry Butcher will sell the stock, plant and machinery of a builder and contractor; also a plot of freehold building land. Catalogues and particulars from Messrs. Russell, Son & Fisher, 3, Sergeant's Inn, E.C. 4; and Messrs. Henry Butcher & Co., 63 & 64, Chancery-lane, W.C. 2.

*DECEMBER 6.—**London.**—Messrs. Toplis & Harding will sell linoleum, 21,000 pieces wall-paper, sewing machines, tubes and fringes for electric light fittings, &c., &c. Catalogues on application to the Auctioneers, 66, Cannon-street, E.C. 4.

*DECEMBER 10.—**London.**—Messrs. Fuller, Horsey & Co. will sell by tender builder's plant and material at the works of the British Alizarine Co., Ltd., Silvertown. Catalogues, with forms of tender, may be had (when ready) of Messrs. Fuller, Horsey & Co., 133, High Holborn, W.C. 1.

Public Appointments.

*NO DATE.—**Macclesfield.**—The Governor of the Macclesfield Certified Industrial School requires a Carpenter-Woodwork Master. Apply, with two copies of testimonials, &c., to the Governor as above.

The Institution of Civil Engineers.

At the ordinary meeting of this Institution, on the 20th inst., a paper on "The Hardinge Bridge over the Lower Ganges at Sara" was read by Sir Robert Richard Gales, F.C.H., M.Inst.C.E. The Hardinge Bridge connects the standard 5 ft. 6 in. gauge system of the Eastern Bengal Railway south of the Ganges with the metre-gauge system north of the river. It comprises fifteen girder spans of 345 ft. 1½ in., with three land spans of 75 ft. at each end. The magnitude of the work, the high and increasing cost of Indian labour, and the importance of rapid completion, indicated the desirability of making greater use of modern plant and special methods of construction than had hitherto been considered economical in India; and the paper described the methods of construction adopted, which, briefly, were the laying down of electric power plant and the use of electric power throughout the bridge, the use of cement concrete blocks in the steening of the well foundations, thereby ensuring great weight in the wells and rapidity in building and sinking, and the employment of a temporary service girder of large span for girder-erection in the water spans, thereby ensuring greater certainty and rapidity of construction and a longer working season than was possible with timber staging under the conditions obtaining.

Historic York Buildings.

Dr. W. H. Evelyn, Hon. Secretary of the York Archæological Society, recently delivered a lecture on "Walks through Old York." Dealing principally with the district of the Castle and St. George's Fields, he illustrated, by means of old pictures and drawings, contrasted with modern photographs of the locality, how many of the most picturesque of the old buildings were allowed by the Corporation of an earlier generation to get into such a state of disrepair that they had to be demolished, thus removing finger-posts which would have pointed the present generation to York's historic past. The Castle, he claimed, was the most wonderful example of mediæval military architecture in Great Britain.

THE BUILDING TRADE.

THE USE OF WHITE LEAD.

WE have received from the National Painters' and Decorators' Joint Council, Manchester, the following letter, which has been sent to the Minister of Munitions. Though the matter with which it deals mainly concerns the painting industry, the principles at stake are applicable to every case in which a material is controlled by the Government.

"SIR,—We, representing the National Painters' and Decorators' Joint Council, beg to lay before you the following statement on a matter of urgent national importance, which nearly concerns your Department. The above Council represents the employers' and operatives' organisations in the painting trade throughout the country, and is therefore fully representative of the industry.

"Our object in addressing you is to draw your attention to the serious position due to the failure of your Department to administer the regulations designed to control the use of white lead.

"Our indictment is as follows:—

"1. That the regulation prohibiting the use of white lead without permit is not being enforced.

"2. That great waste of this material is the normal condition of affairs on Government, and particularly on Admiralty, work.

"3. That controlled firms are apparently free to use white lead without restriction.

"4. That this valuable pigment is being used unnecessarily on temporary war structures, while its use is denied on permanent public buildings of national value.

"5. That the officials of your Department have caused great loss and inconvenience by inexcusable neglect of correspondence.

"Each of these charges we are in a position to substantiate by ample evidence.

"As to the first, though the Government has nominally taken possession of all stocks of white lead, and forbidden its use without permit, it is in fact being used all over the country. This means that the patriotic employer is losing business because others, less scrupulous, do not hesitate to ignore the regulations, whilst the Government, by complete inaction, encourages this violation of the law. This state of affairs has been pointed out repeatedly by our Council to the officials of the Priority Branch. These gentlemen admit their failure, but take no steps to remedy matters.

"Once, indeed, our Council was asked to prepare a scheme for rationing white lead, and without delay it did so. Doubtless, that scheme had faults, but it was at least simple and practicable. Evidently these qualities condemned it in the eyes of the Department, for when it was presented, a deputation from our Council was informed that the amount of white lead available was insufficient to make rationing worth while. The fact remains, that the amount being used to-day, contrary to the regulations, would, if equitably distributed, be of real service to the trade we represent, and the owners of property. The waste on Admiralty work is again admitted. The evidence in this case comes mainly from operatives engaged in the work.

"As to the controlled establishments, the following quotation is from a written statement by an employer who is personally known to us, and whose integrity is beyond question:—

"'A small munition works had to be painted. Enough white lead was secured on permit, (1) to do this work, (2) to enable the master painter who did the job to paint the outside of a mill, contract £130, (3) to enable him to offer to sell a quantity of white lead to anyone wanting any. You can rely on this as a fact and quote it anywhere. In the first place, the works no more needed white lead than any other job. The mill could have waited, or been done with a substitute. Secondly, the works, in common with hundreds of others, considering the times, did not need painting. The cost is put through current account while profits are big to save payment, to that extent, of excess profits duty. In fact, an extra coat of paint was put on, and the painter told he might as well have the money as the Government. This kind of thing is taking place all over the country.'"

"The neglect of correspondence is apparently normal at the Priority Branch. Three weeks is by no means an exceptional delay, and the reply often shows that no trouble has been taken to understand the matter raised. Our first request was for an equitable and workable system of rationing.

"On the declaration of the Government that supplies were insufficient for this, we asked for a real and rigid application of the prohibitive regulations, and that Government Departments should exercise reasonable economy in their use of this valuable material. Surely these requests are reasonable!

"The painting industry is as patriotic as any other. It asks for no privilege, and is prepared for any sacrifice that may be necessary in the national interest.

"But it has the right to ask when regulations of a drastic character affecting the trade are introduced that they shall be administered competently, and in such a manner that the honourable employer is at least on an equality with his less scrupulous competitor. The present position is chaotic, and on behalf of the industry we have the honour to represent we desire to record this protest.

"We beg to subscribe ourselves, on behalf of the National Painters' and Decorators' Joint Council,

"Your obedient servants,

"(Signed)

"J. HIGSON, President National Association of Master House Painters and Decorators of England and Wales (Incorporated).

"W. G. SUTHERLAND, Secretary National Association of Master House Painters and Decorators of England and Wales (Incorporated).

"J. WALSH, Chairman of Executive, National Operative Painters' Society.

"J. PARSONAGE, Secretary, National Operative Painters' Society."

NEW GOVERNMENT CONTRACTS.

War Office.

Apparatus (Drain Cleaning).—Cakebread, Robey & Co., London, N.; M. Jacobs, Young & Co., Ltd., London, S.E.; Marshall Bros., Birmingham.

Apparatus (Water).—United Water Softeners Ltd., Brentford.

Barrows.—Smith, Major & Stevens, Ltd., Northampton.

Baths (Long).—J. Bolding & Sons, Ltd., London, W.; Ewart & Son, Ltd., London, N.W.; T. H. Hill & Sons, Ltd., Wolverhampton; R. Hookham, Ltd., Birmingham; Morrison, Ingram & Co., Ltd., Manchester.

Boilers (Portable).—Callender Iron Co., Ltd., Falkirk.

Boilers (Vertical).—Cradley Boiler Co., Ltd., Cradley Heath.

Bolts and Nuts, &c.—Blakemore & Co., Ltd., Atherton; Gillespie & Mayhew, London, E.C.; Guest, Keen & Nettlefolds, Ltd., Birmingham; Horton & Son, Ltd., Darlaston; T. Mayer & Co., Ltd., Darlaston; Nuts & Bolts (Darlaston), Ltd., Darlaston; J. C. Prestwich, Ltd., Atherton; J. Simpson & Sons (Bolts & Nuts), Ltd., Darlaston; Stones Bros., Ltd., West Bromwich; J. Wiley & Sons, Ltd., Darlaston; Wilkes, Ltd., Darlaston.

Bottoms (Tent, Wood).—H. Lebus, London, N.

Boxes and Chests (Wood).—Herman & Phillips, Ltd., London, N.E.; W. & T. Lock, Bath; Venesta, Ltd., London, E.C.

Cisterns and Tanks.—Baldwin's, Ltd., London, E.; Braithwaite & Co., London, S.W.; Brown, Lenox & Co., Ltd., London, E.; Davies Bros. & Co., Ltd., Wolverhampton.

Cocks and Valves.—Ham, Baker & Co., Ltd., Birmingham; J. Webb & Co., Ltd., Birmingham.

Composition (Steel).—G. Longden & Son, Ltd., Sheffield.

Corrugated Tubing Rings.—Braithwaite & Co., London, S.W.

Glass (Sheet and Plate).—Pilkington Bros., Ltd., St. Helens, Lancs.

Hoists, &c.—Hill & Smith, Ltd., Brierley Hill; Holt & Willetts, Cradley Heath; Tangyes, Ltd., Birmingham.

Huts (Sectional and Parts).—Bowesfield Steel Co., Ltd., Stockton-on-Tees; Browne & Lilly, Ltd., Reading; F. Chown, Bristol and Northampton; A. Fairhead & Son, Enfield; J. Gerrard & Sons, Ltd., Manchester; G. Godson & Sons, Ltd., London, N.W.; Hall, Beddall & Co., London, S.E.; W. Harbrow, Ltd., London, S.E.; J. Harrison, London, S.E.; Hibberd Bros., London, S.E.; T. Higgs, Northampton; Holloway Bros. (London), Ltd., London, S.W.; Humphreys, Ltd., London, S.W.; Jewson & Sons, Norwich; Leverack & Goddard, Ltd., Drypool, Hull; W. Lawrence & Son, London, E.C.; Leslie & Co., Ltd., London, W.; McCormick & Sons, Ltd., London, N.; J. Mead, Ltd., Chesham; Middlesex Joinery Works, Ltd., London, E.; E. Morley & Sons, Derby; Nickel & Co., Bo'ness; J. G. Nutting & Co., Croydon; Rice & Son, London, S.W.; J. Sadd & Sons, Ltd., Maldon; W. Sharp & Sons, Burton-on-Trent; W. Thomas & Sons, Ltd., Wrexham; Thornborough & Co., Ltd., London, N.; W. D. Tucker & Sons, Ltd., London, N.; R. Wilkins & Sons, Bristol; Wolverhampton Corrugated Iron Co., Ltd., Ellesmere Port.

Mallets.—W. Lambert, Nelson, Lancs.

Mixers (Concrete).—T. & R. Lees, Hollinwood, Oldham; F. Parker & Co., Ltd., Leicester; Ransome Ver Mehr Machinery Co., Ltd., Ipswich; W. Shepherd & Sons, Ltd., Rochdale.

Nails, Spikes and Tacks (Copper and Iron).—J. Price, Halesowen; Rownson, Drew & Clydesdale, Ltd., London, E.C.; J. Sadler, Ltd., Birmingham; S. Stone & Co., Ltd., London, S.E.

Paint and White Lead.—Burrell & Co., Ltd., London, E.; Cookson & Co., Ltd., Newcastle-on-Tyne; Craig & Co., Ltd., Glasgow; J. S. Craig & Co., Ltd., Glasgow; Golden Valley Ochre & Oxide Co., Ltd., Bristol; A. H. Hamilton & Co., Glasgow; Jenson & Nicholson, Ltd., London, E.; Locke, Blackett & Co., Ltd., Newcastle-on-Tyne; Mersey White Lead Co., Ltd., Warrington; Naylor Bros. (London), Ltd., Southall; Pilchers, Ltd., London, S.E.; Walkers, Parker & Co., Ltd., Chester; Whiffen & Sons, Ltd., London, S.W.; O. Wilkins & Co., Ltd., Derby.

Piping and Fittings (Metal).—Albion Iron Co. Ltd., London E.C.; W. Bain & Co., Ltd., Coatbridge; Foster Bros., Wednesbury; Nestor Iron Works Co., London, N.E.; F. W. Potter & Co., London, E.C.; Russell Bros., Walsall; J. Russell & Co., Ltd., Walsall; Scottish Tube Co., Ltd., Coatbridge; E. Smith, Ltd., Wednesbury; Stanton Iron Works Co., Ltd., Stanton-by-Dale; Stewarts & Lloyds, Ltd., Glasgow; Windsor Metal Co., Glasgow.

Pumps, &c.—G. Allsebrook & Co., Ltd. Reading; O. Stott, Ltd., Birmingham; J. Truman & Co., Ltd., Birmingham.

Ranges.—Albion Ironworks, Ltd., London, E.C.; Dobbie, Forbes & Co., Larbert, N.B.; Teuton & Co., Ltd., Belper.

Rope (Steel).—W. B. Brown & Co., (Bankhall), Ltd., Liverpool; E. Ellis & Co., Ltd., London, E.; Excelsior Wire Rope Co., Ltd., Cardiff; Glaholm & Robson, Ltd., Sunderland; Rylands Bros., Ltd., Warrington; Whitecross Co., Ltd., Warrington.

Screws (Iron).—Guest, Keen & Nettlefolds, Ltd., Smethwick.

RATES OF WAGES IN THE BUILDING TRADE.

THE following are the present rates of wages in the Building Trade in the principal towns of England and Wales. It must be understood that, while every endeavour is made to ensure accuracy, we cannot be responsible for errors that *may* occur :—

	Masons.	Bricklayers.	Carpenters, Joiners.	Plasterers.	Slaters.	Plumbers.	Painters.	Masons' Labourers.	Bricklayers' Labourers.	Plasterers' Labourers.
	d.	d.	d.	d.	d.	d.	d.	d.	d.	d.
Aberdare	11	11	11	11	11	10½	10	8	8	8
Accrington	11½	11½	11	9½	9	10	9½	7	7	7
Altrincham	11	1/1	1/-	1/-	9	1/1	1/-	9	9	9
Ashton-under-Lyne	1/1	1/1	1/0½	1/-	1/-	1/-	1/-	8½	8½	8½
Barnsley	10½	11½	11½	10½	1/-	1/-	9½	9	9	9½
Barrow-in-Furness	1/0½	1/0½	1/1	10½	1/0½	1/0½	1/-	9	9	9
Barry	1/-	1/-	1/-	1/0½	—	1/-	1/-	9	9	9
Bath	9	9	9	8½	8½	9	8	9	9	9
Bedford	11	11	11	11	11	11	10	9	9	9
Birkenhead	1/-	1/-	1/1½	11	1/-	1/-	11	11½	11½	11½
Birmingham	1/0½§	1/0½§	1/0½§	1/1	1/0½§	1/0½§	11	10	10	10
Bishop Auckland	11	11	11	11	11	10½	10	8	8	8
Blackburn	11½	1/0½	1/-	11	1/-	1/-	10½	8	8	8
Blackpool	1/-	11	1/-	11	11	1/-	10½	6	6	6
Bolton	1/1	1/1	1/1	11½	8½	9½	1/0	7½	7½	7½
Bournemouth	11	11	11	11	11	1/-	10½	8½	8½	8½
Bradford	1/0½	1/0½	1/-	11	11	11	10†	7½	7½	7½
Bridgwater	8½	8½	8½	10½	8½	8	10½†	10	10	10
Brighton	10½	10½	10½	1/-	10½	10½	7½	9	9	9
Bristol	1/0½	1/0½	1/0½	1/0½	—	1/0½	11½	11½	11½	11½
Burnley	11½	11½	11½	10½	9	10½	10½	7	7	7
Burton-on-Trent	11	11	11	11	11	1/-	10½	8½	8½	8½
Bury	1/-	1/-	1/0½	11	11	1/0½	11½	9	9	9
Cambridge	11	10½	10½	10½	11	10½	9	7½	7½	7½
Cardiff	1/-	1/-	1/-	1/-	1/-	1/-	11	9	9	9
Chatham	10	10	10	10	10	10	8½	7	7	7
Chelmsford	8	7½	8½	9	—	7½	6½	5	5	5
Cheltenham	9½	9½	9½	9½	9½	9½	6½	6½*	6½*	6½*
Chester	10½	11	11	11	11	10	7	7½	7½	7½
Chesterfield	1/-	1/-	11	11	10	11	9	8–8½	8–8½	8–8½
Colchester	8	8½	8½	9	8	9	6	5½	5½	5½
Coventry	1/1	1/1	1/1	1/1	1/1	1/1	1/-	10½	11	11
Crewe	9	9½	9½	10½	10	9½	10	7	7	7½
Darlington	11½	11½	11½	11½	10	9½	10	7	8½	8½
Derby	1/-	1/-	1/-	1/-	1/-	9½	11½	9	9	9
Doncaster	9½	10½	10½	9½	9½	9	9	8	9½	9½
Dudley	9½	11	11	10	10	9½	8	9½	9½	9½
Durham	10½	10½	10½	10½	10½	9½	9	7½	7½	7½
East Glam. and Mon. Valleys	10	10	10	10	—	—	9	7	7	7
Exeter	10	10	10	10	10	9½	9	8	8	8
Folkestone	8½	9	9	9½	8½	9	8	7	7	7
Gloucester	10½	11	11	10½	10½	11	10	8½	8½	8½
Grantham	9½	10	9½	9½	10	8½	8	8½	8	8
Grays	—	1/-	1/-	—	—	11	1/-	10	10	10
Grimsby	11½	11½	11½	11½	11	10	10½	8	8	8
Great Yarmouth	10	10	10	10	10	10	8½	7	7	7
Halifax	1/-	1/-	1/-	9	9	9½	7½	9½	9½	9½
Harrogate	10½	9½	11	9	8	1/-	10½	9	9	9
Hartlepools	1/0½	1/1	1/1	1/1	1/-	10½	9	10	10	10
Hastings	10	10	10	10	10	10	9	7	7	7
Hereford	10	10	10	10	10	10	9	7½	7½	7½
Huddersfield	1/-	11	1/-	11½	11½	1/-	10½	9	9	9
Hull	1/1	1/1	1/1	1/1	1/1	1/-	10½	9	9	9
Ipswich	10½	10½	10½	11	10½	1/-	11	9½	9½	9½
Lancaster	10½	10½	11	10	9½	10	8	8	8	8
Leamington Spa	10½	10½	10½	10½	10½	10	9	8	8	8
Leeds	1/1½	1/1½	1/1	1/1	1/1	10½	9	6	6½	7½
Leicester	1/0½	1/0½	1/0½	1/0½	1/0½	1/2	9½	7½	7½	7½
Lincoln	10½	10½	10½	10½	10½	1/0½	10	10½	10½	10½
Liverpool	1/1½	1/1½	1/1½	1/1	1/1	1/1	10	10	11	11
Llanelly	2/-	1/-	1/-	1/-	1/-	1/3	10	8	8	8
London	1/1½¶	1/1½¶	1/1½¶	1/1½¶	—¶	1/2½¶	11	9½	9½	9½
Loughborough	10	10	10½	10	10	10	9	8½	8½	8½
Luton	10½	10½	10½	11½	10½	11	9½	8	8	8
Maidstone	10	10	10	10	10	10	9	7	7	7
Manchester	1/2	1/2	1/2	1/2	1/1	1/2	10	8	8	8
Mansfield	11	11	10½	11	11	11	10	8	8	8
Merthyr Tydfil	11	11	11	11	11	11	10	8½	8½	8½
Middlesbrough	1/0½	1/1	1/1	1/1	1/-	10½	10	8	8	8
Newcastle-on-Tyne	1/1½	1/1½	1/1½	1/1½	1/-	10½	10	8½	8½	8½
Newport, Mon.	11½	11½	11½	11½	10½	10½	9	10	10	10½
Northampton	11	11	11	11	11	10½	11	10½	10½	10½
Norwich	10½	10½	10½	10½	1/0½	11	10½	8½	8½	8½
Nottingham	1/1	1/1	1/1	1/1	11	10½	10	9½	9½	9½
Oldham	1/1	1/-	1/1	1/-	1/0½	11	11½	1/-	8½	8½
Oxford	11	10½	10½	10½	10½	10½	9½	8	8	8
Plymouth	11*	11*	11*	12*	10*	11	10	8½*	8½	8½
Pontypridd	11	11	11	11	11	11	10	8	8	8
Portsmouth	11½	11½	11½	11½	11	11	10½	8½	8½	8½
Preston	10½	1/-	11½	1/-	1/-	10½	9½	8½	8½	8½
Reading	10½	10½	10½	11	10½	10½	9½	8	8	8
Rochdale	1/-	1/-	10½	11	10½	1/-	9	8½	8½	8½
Rochester	10	10	10	10½	10½	1/-	11	9	9	9
Rugby	11	11	11	10	10	10½	10	8	8	8
St. Albans	10	10	10	11½	10	10	10	8½	8½	8½
St. Helen's	1/-	1/-	1/-	1/-	1/-	10	10	8½	8½	8½
Scarborough	9½	9½	9	9½	9½	11	10	8	8	8
Sheffield	1/1½	1/1½	1/1½	1/1	1/1	9½	10½	8½	8½	8½
Shrewsbury	8½	9½	9½	9½	—	1/1	8½	7	7	7
Southampton	11½	11½	11½	11½	11½	11½	10½	8½	8½	8½
Southend-on-Sea	9	9	9	9	P'cework	9	7	6½	6½	6½
Southport	11½	11	11½	11	11	11	11	7	7	7
South Shields	1/1½	1/1½	1/1½	1/1½	1/-	11	11	6	6	6
Stockport	1/1	1/0½	1/0½	1/1	1/-	10½*	11	7	7	7
Stockton-on-Tees	1/0½	1/1	1/1	1/1	1/-	1/-	11	10½	10½	10½
Stoke-on-Trent	11½	11½	11½	11½	—	10½	11½	8½	9	10
Stroud	9½	9½	9½	9½	9½	10½	9	10	10	10½
Sunderland	1/1	1/1½	1/1	1/1	9½	9	10½	8½	8½	8½
Swansea	1/-	1/-	1/-	1/-	1/-	9½	9	7½	7½	7½
Taunton	9	9	9	9	1/-	9½	11½	10	10	10
Torquay	10	10	10	10	1/2	11½	9	9	9	9
Wakefield	10	11	10½	9½	9	10	8	6½	6½	6½
Walsall	11½	11	11	11	8½	10½	10	8	8	8
Warrington	11	1/0½	1/-	1/0½	11	11	9½	8½	8½	8½
West Bromwich	11	11	10½	10½	1/0½	1/-	11	7	7½	7½
Wigan	11½	1/-	11½	11	—	10	9	8	8	8
Windsor	10	10	10	10½	10½	11½	10½	9	9	9
Wolverhampton	1/-	1/-	1/-	11	11	10	10½	7	7	7
Worcester	10	10	10	10	10	10	8½	9	9	9
York	9½	9½	10½	10	10½	8½	8½	7½	7½	7½

The Masons' rate given is for bankers; fixers usually ½d. per hour extra.
* War bonus of 2s. per week granted. † War bonus of 3s. per week granted. ‡ War bonus of 3s. 6d. per week granted.
§ War bonus of 6s. per week granted. ‖ 1d. per hour extra for men engaged on munition work.
¶ 1½d. per hour extra for men engaged on munition work.

PROPOSED NEW BUILDINGS AND OTHER WORKS.*

IN these lists care is taken to ensure the accuracy of the information given, but it may occasionally happen that, owing to building owners taking the responsibility of commencing work before plans are finally approved by the local authorities, "proposed" works, at the time of publication, have been actually commenced. Abbreviations:—T.C. for Town Council; U.D.C. for Urban District Council; R.D.C. for Rural District Council; E.C. for Education Committee; L.G.B. for Local Government Board; B.G. for Board of Guardians; L.C.C. for London County Council; B.C. for Borough Council; and P.C. for Parish Council.

ABRAM.—The U.D.C. has decided that the chairman of the Council, vice-chairman, and the chairmen of committees, with the clerk and surveyor, make a visit of inspection to the houses in course of erection a Westhoughton by the Council under the Housing of the Working Classes Act, in view of the proposed erection of similar houses in the Abram district.

BARROW.—The contract for the erection of over 200 houses, as a start, with a view to getting over the Barrow housing difficulty, has been let to the Creighton Construction Co., Ltd. The houses are to be erected on Roose-road, and they will be built of concrete.

BIRMINGHAM.—The Birmingham City Council have applied to the L.G.B. for permission to borrow £118,000 for the reconstruction of portions of the Hockley main sewer, and for the deepening of the Hockley Brook.

BLACKBURN.—The Corporation has decided to build 500 houses after the war.

BRIDLINGTON.—Extensions to stables at Portland-place depot, for the Corporation.

BROMFORD BRIDGE.—The Birmingham, Tame and Rea District Drainage Board has sold 40 acres of land at Bromford Bridge to John Wright and Eagle Range, Ltd.

BUCKIE.—The T.C. have received letters from the Buckie Lifeboat Committee and the Committee of Management of the Institution in London, with reference to the erection of a new lifeboat house at Buckie.

DROITWICH.—For the Bill being promoted by the Shropshire, Worcestershire and Staffordshire Electric Power Co., power is taken to acquire land at Hartlebury, Droitwich, on which to erect a generating station.

GALASHIELS.—The Public Health Committee of the T.C. have informed the L.G.B. that 100 three or four-roomed houses were required in Galashiels.

HACKNEY.—Notices received by the B.C.:—J. Hamilton & Son, to build and drain a shed at Sherry's timber wharf and mills on the south-western side of the Lee Navigation Cut, to the north-west of the Homerton Bridge; R. B. Allen, to build and drain a urinal at the factory premises, No. 5, Urswick-road; S. B. K. Caulfield, to build and drain four water-closets and a lavatory at Messrs. G. Ellis & Co.'s Saw Mills on the north-eastern side of Lee Conservancy-road; George Jennings, Ltd., to execute works of re-drainage at the "Prince of Wales" public house, No. 259, Dalston-lane (next Clarence-road).

HEXHAM.—Plans approved:—Two w.c.'s at the inn, Riding Mill, for the Newcastle Breweries Co., Ltd., Haymarket, Newcastle-on-Tyne; an outbuilding, at Calf's Close House, Wall, for Mr. Watson, Wall.

HIPPERHOLME.—At a recent meeting of Hipperholme D. C. it was agreed that the Council should purchase Lower Crow Nest Farm, Lightcliffe, for the purposes of housing of working classes. Ccr. Womersley said they had received instruction to provide 300 houses for the working classes as soon as possible.

HULL.—The Hull Corporation Property Committee has appointed a Sub-committee with instructions to prepare a scheme for the erection of a landing-stage at Victoria Pier, and to report upon other desirable improvements connected with the passenger and goods traffic on the Humber Ferry.

LAUNCESTON.—At a recent meeting of Launceston R.D.C. on the question of housing, a resolution was passed that urgent steps should be taken to repair existing cottages, which would reduce the need for so much new building.

STAFFORD.—Staffs C.C. has agreed to purchase the freehold premises known as the Old Blue Posts public house, in Martin-street, Stafford, belonging to Messrs. Eley's Stafford Brewery, Ltd., for the purpose of providing additional office accommodation, and that the county architect be authorised to carry out the necessary alterations to the Old Blue Posts premises and arrange for the fitting up of the same as offices at a cost not exceeding £200.

WILLESDEN.—Plans approved":—Greenhouse addition at rear of 55, Vicarage-road, Willesden, by Mr. A. James, for Mr. D. Squibb; workshop addition, Hawthorn-road, Willesden-green, by Messrs. F. Thoy & Co., for the British Ensign Motors, Ltd.; additional sanitary accommodation at rear of 15, Lonsdale-road, Kilburn, by Mr. R. W. McWhinnie, for Mr. S. Barnett; bungalow in connection with the Dean Hotel Farm, Dollis Hill-lane, by Messrs. Elgood & Hastie; (a) extension to metal panel shop; (b) extractor house; (c) propeller shop; (d) extension to machine shop; (e) metal shop; (f) extension to tool-room, Cumberland-avenue, Park Royal, by Messrs. Saville & Martin, for Messrs. F. W. Berwick & Co., Ltd.; new stores, die casting shop and enamelling shop, extensions to Central Works, Edgware-road. Cricklewood, by Mr. Robert Angell, for Messrs. S. Smith & Sons (M.A.), Ltd.; new offices and workshops, Wellington-yard, Wellington-road.

* See also our list of Competitions, Contracts, &c. on p. xiv.

(*Continued on page* 322.)

PRICES CURRENT OF MATERIALS.

[Owing to the exceptional circumstances which prevail at the present time, prices of materials should be confirmed by inquiry. Since our last issue several revisions have been made —Ed.]

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the highest or lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

Per 1,000 Alongside, in River Thames. £ s. d.
Best Stocks 2 10 0
Picked Stocks for Facings 3 5 0

Per 1000, Delivered at Railway Depot, London.

	£ s. d.		£ s. d.
Flettons	2 3 0	Best Blue Pressed Staffordshire ...	6 5 0
Best Fareham Red	4 0 0	Do. Bullnose ..	6 10 0
Best Red Pressed Ruabon Facing..	6 0 0	Best Stourbridge Fire bricks	9 5 0
GLAZED BRICKS—			
Best White, Ivory, and Salt Glazed Stretchers ..	14 17 6	D'ble Str'tch'rs	20 7 6
		D'ble Headers	17 7 6
		One Side and two Ends ..	21 7 6
Headers.....	14 7 6	Two Sides and one End	22 17 6
Quoins, Bullnose and 4½in. Flats	18 7 6	Splays and Squints.....	19 17 6

Glazed bricks priced at so much each, 25 per cent. advance on list.

Second Quality, £1 per 1,000 less than best.

	s. d.	
Thames Ballast	8 9	per yard, delivered.
Pit Sand	11 0	
Thames Sand	12 0	,, ,, ,,
Best Washed Sand	12 0	,, ,, ,,
¾ in. Shingle for Ferro-Concrete	11 6	,, ,,

Per ton, delivered.

	£ s. d.		£ s. d.
Best Portland Cement	2 15 0 ..		2 18 0

Do. £2 11s. 0d. alongside in 80-ton lots.
Ferrocrete 2s. 6d. per ton extra on above.
Best Ground Blue Lias Lime 1 7 6 at rly. depot.
NOTE.—The cement or lime is exclusive of the ordinary charge for sacks. The sacks are charged at 2s. 3d. each and credited at 2s. each if returned in good condition within three months.
Grey Stone Lime ..... 47s. 0d. per ton delivered.
Stourbridge Fireclay in s'cks 37s. 6d. per ton at rly. dpt.

STONE.

	s. d.
BATH STONE—delivered in railway trucks at Westbourne Park, Paddington, G.W.R., or South Lambeth, G.W.R., per ft. cube.....	1 7
Do. do. delivered in railway trucks at Nine Elms, L. & S.W.R., per ft. cube	1 8½
Do. do. delivered on road waggons at Nine Elms Depot	1 9½
PORTLAND STONE—	
Brown Whitbed, in random blocks of 20 ft. average, delivered in railway trucks at Westbourne Park, G.W.R., South Lambeth, G.W.R., or Nine Elms, or L. & S.W.R., per ft. cube	2 5½
Do. do. delivered on road waggons at Pimlico Wharf or Nine Elms Depot, per ft. cube..	2 6½
White basebed, 2d. per ft. cube extra.	

RANDOM BLOCKS—Per Ft. Cube, delivered at Rly. Dpot.

	s. d.		s. d.
Ancaster in blocks	2 0	Closeburn Red	
Beer in blocks ...	1 7½	Freestone	2 2
Grinshill in blocks	2 4	Red & White Mansfield random block	2 9
Darley Dale in blocks	2 5	Yellow Magnesian Limestone do. do	3 3

YORK STONE—*Robin Hood Quality.*

Delivered at any Goods Station London.

	s. d.
Scappled random blocks .....Per Ft. Cube	3 11
6 in. sawn two sides landings to sizes (under 30 ft. super.) .....Per Ft. Super	3 0
6 in. rubbed two sides, ditto ..... ,,	3 4
3 in. sawn two sides slabs (random sizes) ,,	1 3½
2 in. to 2½ in. sawn one side slabs (random sizes) ..... ,,	0 10
1½ in. to 2 in. ditto, ditto ..... ,,	0 8½
HARD YORK—	
Delivered at any Goods Station London.	
Scappled random blocks .....Per Ft. Cube	3 6
6 in. sawn two sides landing to sizes (under 40ft. super.) .....Per Ft. Super	2 8
6 in. rubbed two sides ditto ..... ,,	2 4
3 in. sawn two sides slabs (random sizes) ,,	1 3
2 in. self-faced random flags ..... ,,	0 5½

TILES.

	Per 1,000 f.o.r. London. £ s. d.
Best machine-made tiles or hand-made sand-faced tiles from either Broseley or Staffordshire district.....	3 0 0
Ornamental ditto	3 2 6
Hip and valley tiles (per dozen)	0 6 0

SLATES.

	Per 1,000 of 1,200 f.o.r. London. £ s. d.
Best Blue Bangor Slates, 20 by 10	13 5 0
,, ,, ,, 16 by 8	6 12 6
First quality ,, ,, 20 by 10	12 15 0
,, ,, ,, 16 by 8	6 10 0
Best Blue Portmadoc 20 by 10	13 5 0
,, ,, 16 by 8	6 12 6
First quality ,, 20 by 10	12 12 6
,, ,, 16 by 8	6 7 6

WOOD.

BEST BUILDING REDWOOD. Imported sizes.
Deals: 4 in. by 12 in., 4 in. by 11 in., 3 in. by 11 in., 4 in. by 9 in., and 2 in. by 11 in. ..... } *Softwood stocks controlled by the Director of Materials, consequently prices must be withdrawn*
in. by 9 in., 2½ in. by 9 in., and 2 in. by 9 in. ..... }

WOOD (*Continued*).

BEST BUILDING REDWOOD.
Battens: 2 in., 2½ in., and 3 in. by 8 in. .....
2 in., 2½ in., and 3 in. by 7 in. .....
2 in., 2½ in., and 3 in. by 6 in. .....
Scantlings: 2 in. by 3 in., 2 in. by 3½ in., 2 in. by 4 in., 2 in. by 4½ in. ...
3 in. by 4 in., and 3 in. by 4½ in. .....
Boards: 1 in., 1¼ in., and 1½ in. by 6 in. and 7 in.
¾ in. .....
Seconds .....
Sawn pitch pine logs (about 35 cu. ft. average .....
Do. 6 in. to 10 in. ..
Best Pitch Pine Deals ....
Under 2 in. thick .....

JOINERS' WOOD

White Sea First Quality Red: 4 in. by 11 in...
3 in. by 11 in., and 2 in. by 11 in. .....
4 in. by 9 in. .....
3 in. by 9 in., and 2½ in. by 9 in. .....
3 in. by 11 in. boards ..
7 in. and 8 in. battens ..
7 in. and 8 in. boards ...
Archangel White Deals—
Best 3 in. by 9 in. and 10 in. and 11 in. .....
Seconds, do. .....
U.S. Battens .....
Prepared Floorings and Matchings. Seconds Swedish Red and equal—
1¼ in. by 6½ in. planed and shot .....
1¼ in. by 6½ in. planed and matched .....
1 in. by 6½ in. planed and shot .....
1 in. by 6½ in. planed and matched .....
¾ in. by 6½ in. planed, matched, and beaded, or V jointed .....
1 in. by 6½ in. do. .....
Columbian or Oregon Pine, best quality .....
Yellow Pine—First regular sizes .....
Oddments .....
Seconds, regular sizes ..
Oddments .....
Kauri Pine—Planks per ft. cube.....

Softwood stocks controlled by the Director of Materials, consequently prices must be withdrawn.

Dry Wainscot Oak, per ft. super, as inch	0	1	6	..	0	2	0
¾ in. do. do.	0	1	3	..	0	1	6
Dry Mahogany—Honduras, Tabasco, per ft. super, as inch.....	0	2	0	..	0	3	0
Cuba, Mahogany	0	2	6	..	0	3	6
Dry Walnut, American, per ft. super, as inch	0	2	0	..	0	3	0
French, "Italian," Walnut	0	3	0	..	0	5	0
Teak, per load (Rangoon or Moulmein)	45	0	0		60	0	0
Do. do. (Java)							
American Whitewood planks, per ft. cube ..	0	18	0	..	1	1	0
Glue, per cwt.	5	15	0	..	6	0	0

METALS.

JOISTS, GIRDERS, &c.

Rolled Steel Joists, ordinary sections, basis price .....
Plain Compound Girders, ordinary sections .....
Plain Compound Stanchions
Angles, Tees, and Channels, ordinary sections .....
Flitch Plates .....
Cast Iron Columns and Stanchions, plain ordinary patterns .....

Prices controlled by the Ministry of Munitions.

WROUGHT-IRON TUBES AND FITTINGS—
(Discount off List for lot of not less than £4 net value delivered direct from works. 5 per cent. less carriage forward if sent from London stocks.)

	Tubes.	Fittings.
Gas	42½	47½
Water	42½	45
Steam	42½	42½
Galvanised gas	25	40
,, water.....	16	37½
,, steam	13	35

L.C.C. SOIL PIPE—

	Pipes Coated. s. d.		London Prices. Bends. s. d.		Branches. s. d.
2 in. per yd..	2 10	....	2 3	each	2 8
2½ in. ,, ,,	3 3	....	2 6	,,	3 4
3 in. ,, ,,	4 0	....	2 8	,,	4 0
3½ in. ,, ,,	4 5	....	3 4	,,	4 7
4 in. ,, ,,	4 10	....	3 9	,,	5 3

RAIN-WATER PIPES, &c.

	Pipe. s. d.		London Prices. Bends. s. d.		Branches. s. d.
2 in. per yd..	2 1	....	1 3	each	1 8
2½ in. ,, ,,	2 3	....	1 6	,,	2 1
3 in. ,, ,,	2 7	....	1 9	,,	2 8
3½ in. ,, ,,	3 2	....	2 2	,,	3 2
4 in. ,, ,,	3 4	....	2 7	,,	3 10

L.C.C. DRAIN PIPES,—9 ft. lengths. London Prices. 4 in., 5s. 5d. .. 5 in., 6s. 9d. .. 6 in., 7s. 11d.

Per ton in London.

IRON—	£ s. d.		£ s. d.
Common Bars	16 10 0 to	17 0 0	
Staffordshire Crown Bars - good merchant quality	16 10 0 ..	17 10 0	
Staffordshire "Marked Bars"	17 10 0 ..	18 0 0	
Mild Steel Bars	19 0 0 ..	19 10 0	

METALS (*Continued*).

Per ton in London.

	£ s. d.		£ s. d.
Steel Bars, Ferro-Concrete quality, £19 basis price.			
Hoop Iron, basis price ..	20 10 0 ..	21 0 0	
,, ,, Galvanised ..	33 0 0 ..	—	
(* And upwards, according to size and gauge.)			
Sheet Iron Black—			
Ordinary sizes to 20 g. ..	22 10 0 ..	23 0 0	
,, ,, 24 g. ..	23 10 0 ..	24 0 0	
,, ,, 26 g. ..	24 10 0 ..	25 0 0	
Sheet Iron, Galvanised flat, ordinary quality—			
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g. ..	34 0 0 ..	—	
Ordinary sizes to 22 g. and 24 g.....	34 0 0 ..	34 10 0	
Ordinary sizes to 26 g. ..	36 0 0 ..	36 10 0	
Sheet Iron, Galvanised, flat, best quality—			
Ordinary sizes to 20 g. .. ,, ,, 22 g. and 24 g.	35 10 0 ..	—	
	36 0 0 ..	—	
Ordinary sizes to 26 g. ..	39 0 0 ..	—	
Galvanised Corrugated Sheets—			
Ordinary sizes, 6 ft. to 8 ft. 20 g.....	33 0 0 ..	—	
Ordinary sizes, 22 g. and 24 g.....	33 10 0 ..	—	
Ordinary sizes, 26 g.	32 10 0 ..	—	
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. to 20 g. and thicker.....	24 10 0 ..	—	
Best Soft Steel Sheets, 20 g. and 24 g.....	24 15 0 ..	—	
Best Soft Steel Sheets, 26 g.	26 10 0 ..	—	
Cut Nails, 3 in. to 6 in.	28 0 0 ..	29 0 0	
(Under 3 in., usual trade extras.)			

LEAD, &c.

Delivered in London.

	£ s. d.	
LEAD—Sheet, English, 4 lb. and up	38 10 0 ..	—
Pipe in coils	39 0 0 ..	—
Soil Pipe	42 0 0 ..	—
Compo pipe	42 0 0 ..	—

NOTE—Country delivery, 20s. per ton extra; lots under 5 cwt., 1s. 6d. per cwt. extra. Cut to sizes, 2s. cwt. extra. Orders for over 1 cwt. Sheet Lead or Pipe, or 28 lbs. Solder should be accompanied by a certificate or licence, which can be obtained from the Director of Materials [A.N.2 (E)], Hotel Victoria, S.W. Smaller quantities than the above can be obtained by making a written declaration to the Manufacturer or Merchant that the metal is wanted for urgent renewals or repairs, and giving the name of the job for which it is required.

		£ s. d.	
COPPER—			
Strong Sheet ....per lb.		0 2 2 ..	—
Thin ,, ... ,,		0 2 3 ..	—
Copper nails .... ,,		0 2 2 ..	—
Copper wire .... ,,		0 2 3 ..	—
TIN—English Ingots ,,		0 2 10 ..	—
SOLDER—Plumbers' ,,		0 1 3 ..	—
Tinmen's..... ,,		0 1 8 ..	—
Blowpipe ..... ,,		0 1 10 ..	—

GLASS.

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES AND IN SQUARES IN ORDINARY SIZES.

	Per Ft		Per Ft.
15 oz. fourths	6d.	32 oz. fourths	9d.
,, thirds	6½d.	,, thirds	10d.
21 ,, fourths	7d.	Fluted, Obscured and	
,, thirds	7½d.	Enamelled Sheet,	
26 ,, fourths ..	8d.	15 oz.	7½d.
,, thirds	9d.	21 ,,	8½d.

Extra price according to size and substance for squares cut from stock.

ENGLISH ROLLED PLATE IN CRATES OF STOCK SIZES.

	Per Ft.
⅛ Rolled plate	4½d.
3/16 Rough rolled and rough cast plate.....	5½d.
¼ Rough rolled and rough cast plate.....	5½d.
Figured Rolled, Oxford Rolled, Baltic, Oceanic, Arctic, Stippolyte, and small and large Flemish white	6d.
Ditto, tinted	7d.
Rolled Sheet	5d.
White Rolled Cathedral.....	5d.
Tinted do.	5½d.

PAINTS, &c.

	£ s. d.
Raw Linseed Oil in pipes..... per gallon	0 5 6
,, ,, ,, in barrels .... ,,	0 5 7
,, ,, ,, in drums .... ,,	0 5 10
Boiled ,, ,, in barrels .... ,,	0 5 10
,, ,, ,, in drums .... ,,	0 6 1
Turpentine in barrels ..... ,,	0 8 3
,, in drums ..... ,,	0 8 6
Genuine Ground English White Lead, per ton (In not less than 5 cwt. casks.)	53 10 0
GENUINE WHITE LEAD PAINT— "Blackfriars," "Nine Elms," "Park," and other best brands (in 14 lb. tins) not less than 5 cwt. lots. per ton delivered	69 0 0
Red Lead, Dry (packages extra) .. per ton	42 0 0

Orders for White and Red Lead and any Paint containing Lead must be accompanied by a certificate or licence, which can be obtained from the Director of Materials [A.N. 2 (E.)], Hotel Victoria, S.W.

Best Linseed Oil Putty ..... per cwt.	0 15 6
Filocol..... per cwt.	0 13 6

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Pale Oak	0 10 0
Pale Copal Oak	0 12 0
Superfine Pale Elastic Oak.....	0 14 6
Fine Extra Hard Church Oak	0 12 6
Superfine Hard-drying Oak, for seats of Churches	0 16 0
Fine Elastic Carriage	0 14 6
Superfine Pale Elastic Carriage	0 18 0
Fine Pale Maple	0 12 0
Finest Pale Durable Copal.....	1 0 6
Extra Pale French Oil	1 3 0
Eggshell Flatting.....	1 0 0
White Pale Enamel	1 6 0
Extra Pale Paper.....	0 12 0
Best Japan Gold Size	0 10 0
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 0
Berlin Black.....	0 16 0
Knotting	1 7 6
French and Brush Polish	0 12 0

[*Continued from page 320.*]

ton-road, Kensal Green, by and for Messrs. Chinchen and Co.; storage tanks for benzol in pits at works premises, Maybury-gardens, Willesden Green, by Messrs. William and Edward Hunt, for the British Cellulose & Chemical Manufacturing Co., Ltd.; alteration to existing garage, Maybury-gardens, Willesden Green, by Mr. W. Sharp, for the British Cellulose & Chemical Manufacturing Co., Ltd.; alterations and additions at 24 and 26, Lonsdale-road, Salusbury-road, by Messrs. Bovis, Ltd.; new sanitary accommodation, the Slade, Cricklewood-broadway by Messrs. Harrison & Co., for the Whitlock Motors, Ltd. The following plans are also before the U.D.C.:—Alterations and additions at 197, Cricklewood-broadway, N.W., by Mr. H. Robert Astley, for the Lamplough Radiator and Engineering Co., Ltd.; drying and inspection shed and gas generator shed, Waxlow-road, Acton-lane, by Mr. T. Jay Evans, for the Luxfer Prism Syndicate, Ltd. Plans of temporary buildings approved:—Iron store and motor shed rebuilt in altered position at Hawthorn-road and Strode-road Willesden Green, by and for the British Ensign Motors, Ltd.; factory, Dog-lane, Stonebridge-park, by and for Messrs. Haymills, Ltd.; timber drying shed, Cricklewood Broadway, by and for the British Caudron Co., Ltd.; shed for lorry at 179, High-road, Kilburn; bicycle shed at 179, High-road, Kilburn; two lavatory blocks at the Y.M.C.A. Stores, Wrottesley-road, Harlesden by Messrs. W. Silk & Son, for the Y.M.C.A.; workshop and motor shed at Wrottesley-road, Harlesden, by Messrs. W. Silk & Son, Ltd. for the National Council of Y.M.C.A.; machine shop, Dog-lane, Willesden, by and for Messrs. Haymills, Ltd.; Re-erection of shed Edinburgh Biscuit Works, Waxlow-road, by Mr. T. W. Willard, for Messrs. McVitie & Price, Ltd.; new coal house at Newman House, Belton-road, Willesden, by Mr. R. Bell, for Messrs. H. & T. Kirby; temporary roof and new lavatories at 197, Cricklewood-broadway, by Mr. H. Robert Astley, for the Lamplough Radiator Co. Ltd.; amended plan, temporary end to workshop at rear of White Hart Hotel, Church End, Willesden by and for Mr. F. Wellstead.

Future of Belfast.

The Belfast Harbour Commissioners anticipate great developments in the port, both as a shipbuilding centre and shipping *entrepôt* after the war. By a Bill which they propose to introduce in the next Session of Parliament they seek powers to construct a new deep-water channel on the Antrim side of the river, terminating in two docks close to the city and the Midland Railway Company's line. It is estimated that the new channel and docks will cost upwards of £2,000,000 to construct. The Commissioners propose also to construct another large graving dock alongside the present one, which will be almost a thousand feet long.

TENDERS.

* Denotes *accepted*. † Denotes *provisionally accepted*. ‡ Denotes *recommended for acceptance*.

CAVAN (IRELAND).—For painting work and repairs, &c., at the County Courthouse, Cavan, for the C.C.:—

*P. Duffy & Sons, Monaghan..... £785

HEMEL HEMPSTEAD.—For works of repair and renovation required to be carried out at the Maternity and Child Welfare Centre at Hemel Hempstead, for the Herts C.C.:—

*E. & G. Glenister, Marlowes, Hemel Hempstead..... £85

KILLARNEY.—For rebuilding the bridge over Anawilin stream between Callin Cross and Allohart, for the Killarney B.G.:—

*James O'Connor £193

LONDON.—For reinstating and improving the steward's stores at the Infirmary, Lower-road, Rotherhithe, S.E., for the Bermondsey B.G. Mr. A. H. Newman, F.R.I.B.A., architect.

*Mr. H. Kent, Hither Green, S.E... £1,683 15

WEST HAM.—Installation of heating system at Gainsborough-road and Holborn-road Schools, for the Education Committee.

*J. T. Halsey, £194 and £38 10s. respectively.

NEW COMPANIES.

The undermentioned particulars of new companies recently registered are taken from the Daily Register compiled by Jordan & Sons, Ltd., Company Registration Agents, Chancery Lane, W.C.

MARK BROOK & SONS, LTD., HUDDERSFIELD (148,882). Registered November 13. To acquire and take over as a going concern the business of builders and contractors. Nominal capital £10,000 in 10,000 £1 shares.

E. T. SMALL & CO., LTD. (148,879). Registered November 13. To acquire and take over as a going concern and carry on the business of a builder, contractor and decorator. Nominal capital £10,000 in £1 ordinary shares.

PATENTS.

APPLICATIONS PUBLISHED.*

110,389.—Alfred Edward Robbins: Mouldings for use as picture rails.

110,397.—Jose Eguardo Alfaro and J. Stone & Co.: Safety communication systems and doors for buildings and other purposes.

110,403.—James Thomas Tattersall: Method and means for building walls subject to heat.

110,434.—William Williams and Joseph Guest: Manufacture of the chisel-shaped ends of spikes.

110,449.—Robert Morrison Neilson (Thomas Archibald Miller Brownlie): Tube wells.

110,468.—David Wilfred Mitchell and Squire Franklin Wilson: Mausoleums.

110,487.—Edwin Thurnham Palmer: Extension ladders.

110,495.—Alfred Palmer and Arthur William Blackmore: Foldable packing cases or boxes.

110,506.—Alfred Jerrold-Nathan: Device for securing pictures or the like against displacement upon the walls or other surfaces from which they are hung.

110,507.—Frederick Percy Dolamore: Method of constructing seawalls, river walls, jetties and groynes.

110,531.—John Thomas Price and William John Price: Tunnel dryers for drying bricks and retorts.

110,570.—William Marriott: Reinforcements for reinforced concrete constructions.

110,587.—Walter Wilson: Slab or block buildings.

110,615.—Messrs. Benham & Sons and Charles Reed Allensby: Appliances for burning off paint.

110,643.—Thomas Perronet Barker and Thomas Piggott & Company: Flanged steel tanks.

* All these applications are now in the stage in which opposition to the grant of Patents upon them may be made.

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Tubes & Fittings	Brass & Iron Foundry	'Stippolyte' ,,	Ground Colours
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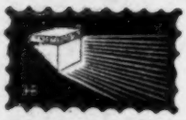

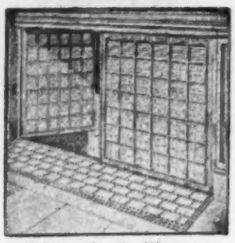

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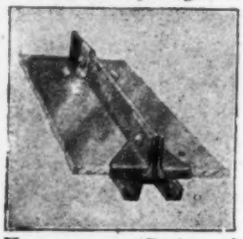

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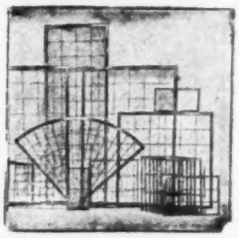

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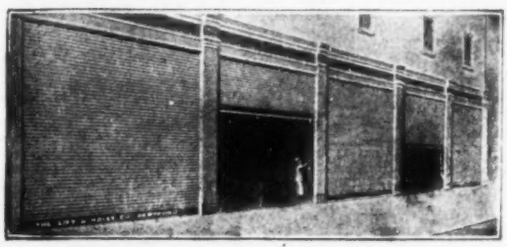

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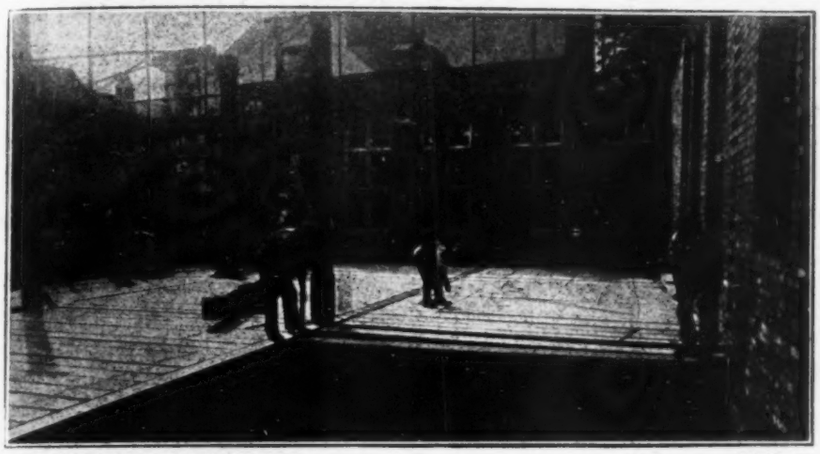

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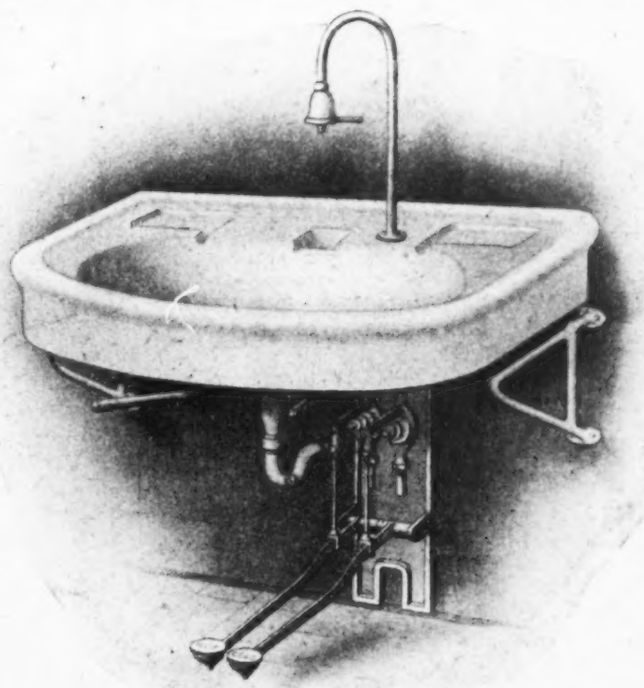

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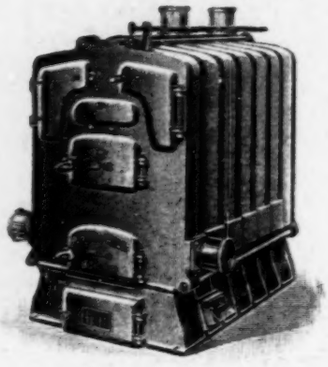

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